..THE IRON AGE..

NEW YORK, OCTOBER 29, 1931

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STABILITY IS INDUSTRY'S GREATEST NEED

... UNDER the lash of adversity the world is moving toward a sounder and more orderly economic system. Narrow selfishness is giving way to a sense of social responsibility, to a keener appreciation of the interdependence of all business, national and international. Provincialism is giving place to a realization that economic dislocations and political disturbances, no matter where they are, have world-wide repercussions. An example of these far-reaching effects—cited by President Schwab in addressing the American Iron and Steel Institute—was the blighting of forces working for business recovery in this country last spring by foreign financial difficulties.

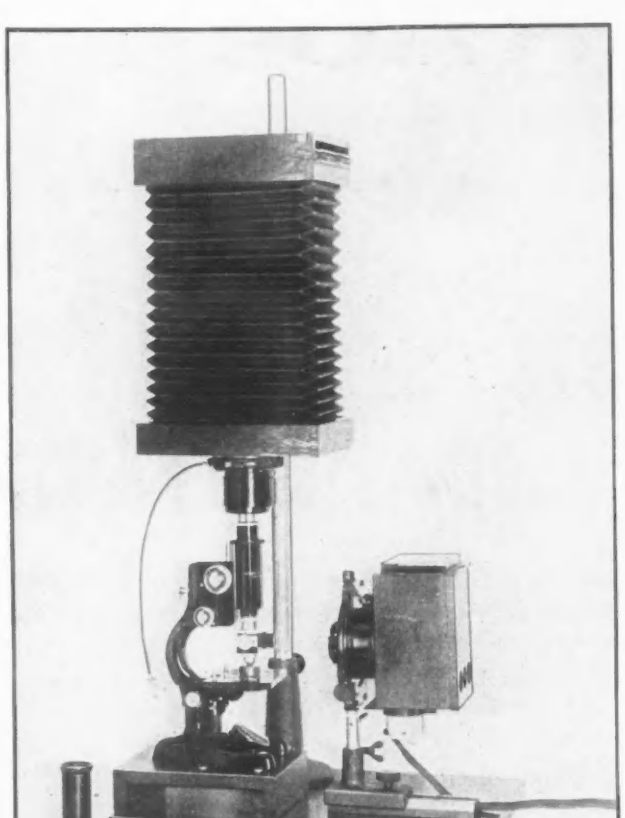
Capital demands peace. Capital demands stability. When political unrest or economic maladjustments reach proportions that destroy confidence, capital becomes timid. The flight of gold from the mark and then away from the pound was followed by gold withdrawals from this country and widespread hoarding of the metal in France. The credit structure of the whole world was disturbed and the statesmen of leading countries were forced to collaborate to seek ways of restoring equilibrium.

The demands of capital will be met. Business will not flourish where festering grievances threaten the peaceful relations of neighboring countries or where Government outlays for social services impose tax burdens too heavy for industry to bear. And enterprise will not thrive under conditions of unrestrained and wasteful competition.

The kind of competition that leads to excessive plant capacity and overproduction injures stockholder, workman and customer. It produces a condition of unsettlement, which is the greatest restraint on business. And, with modern output so great and distribution so universal, instability of local scope may easily lead to national or international dislocations. The logical solution is to balance production with demand. Such a move, Walker D. Hines told Steel Institute members, would not reduce demand, but would increase it, since stability increases confidence.

What industry wants, in his view, is not agreements in restraint of trade, but agreements to promote trade. In his opinion, the anti-trust laws prohibit agreements to limit capacity only when the purpose is to create an artificial shortage and thereby raise prices. They do not, in his belief, ban concerted action to restrict capacity so that there will be no surplus.

Whether or not his interpretation of the statutes is correct, it is evident that blind competitive expansion of capacity is as surely a thing of the past as economic and political isolation in world affairs. Both nationally and internationally the greatest need of industry is stability.



THE MICROSCOPE FO

LABORATORY control of production by means of the microscope is by no means as expensive as many executives think, declares the author of this article, which describes the equipment and experience of a small plant using such control. Some of the many results from the use of this equipment in detecting faulty metal or heat treatment are convincingly presented.

By G. E. SHOEMAKER
Metallurgist, Western Automatic Machine Screw Co.
Elyria, Ohio

FEW executives of today are unwilling to concede to metallography its rightful position of importance in industry, in the control of heat treatment, inspection of materials and development of processes. Many of them, however, are in error as to the cost of equipment necessary. They are in the habit of saying: "We need laboratory control, it's a good selling point and we'd like to have it, but it costs too much." We shall endeavor to show that such control may be achieved at a very reasonable expense.

The floor plan, Fig. 1, shows the layout of equipment in our laboratory. The floor space required is approximately 400 sq. ft.; yet we are equipped to determine all the common elements found in steel, such as carbon, manganese, silicon, sulphur, phosphorus, nickel, chromium, tungsten and vanadium. We have analyzed at times 200 samples in a month with two men working in the laboratory, one man on chemical analysis, the other on microscopic work, physical testing, milling samples and other miscellaneous work. Chemical samples are milled on a small hand-feed milling machine.

The tensile machine is a 30,000-lb. Olsen. It is used for tensile and compression tests on a wide variety of forms and materials. Most purchasers of metal parts specify certain minimum physical properties, and, of course, it is impossible to guarantee these properties without testing.

Then, of course, we have a microscope. We shall give particular attention to it and its accessories for three reasons: First, it is one of the most expensive articles of equipment in the laboratory. Second, it is one of the most important tools of metallurgy; and third, there is without doubt a great deal of misinformation extant about microscopes.

Two Types of Microscopes Used

Of the two types of metallographic microscopes, the Sauveur vertical type and the later inverted type, each has some advantages. The large modern inverted microscope with its rigidly alined base is preeminent for accurate photomicrography at high magnifications. The smaller, vertical microscope is just as useful for another class of work. It is compact and inexpensive and its easy portability and simplicity of operation recommend it for control work and "trouble shooting."

Our microscope is a Bausch & Lomb type FSM-5, with clock feed arc lamp and a JMAA camera. The optics used are—objectives 32 mm., 16 mm., 4 mm. and 1.8 mm. Fluorite oil immersion. The eyepieces are 5x Huygenian and 10x Hyperplane. These lenses give magnifications of 20, 40, 50, 100, 225, 450, 500 and 1000 diameters for visual observation and up to 2000 diameters for photography, the latter being gained by an increase in bellows draw. A 10x Huygenian eyepiece with a glass micrometer disk is used

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for measuring case depth of carburized or cyanided parts, or decarburization, directly in thousandths of an inch.

Use of Various Equipment

For photomacrography we use a self-contained tube microscope which gives a magnification of 10 diameters. The photographs here reproduced as Figs. 6a and 6b were taken with the 10-power tube. Fig. 2 is a photo at full size taken with a series 11b Tessar lens. The Tessar lens is very useful for photographing fractures, deep-etched specimens and other objects at slight magnifications or reduction. The range of our Tessar lens with the camera herein described is from approximately one-third size up to 2¾ diameters.

Optics required for any installation must be governed by the type of work which is to be done. For instance, Hyperplane eyepieces are necessary for best results in photomicrography, but are not required for visual observation. Most micro work is done at 500 diameters or less; so the oil immersion objectives are not always necessary. A 6-volt 110-watt Mazda lamp is sometimes used for illumination in visual work, but we have found the clock feed arc lamp more dependable. It is quite as easy to operate and, due to the greater intensity of its light, a much shorter exposure can be given in taking photographs.

Some Advice on Polishing and Etching Specimens

Accessory equipment for the metallography will include a polishing machine with emery wheels and cloth covered disks; etching reagents and a dark room for developing and printing pictures. There are several good polishing machines on the market and the choice must be governed by the class of work required. For routine examination of case depth and control of heat treatment it is not necessary for the entire surface of the specimen to be free from scratches. For fast work we prefer to grind the

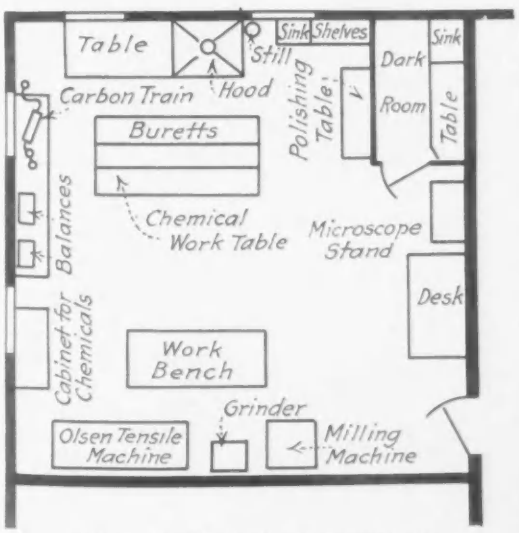

FIG. 1—FLOOR PLAN OF LABORATORY

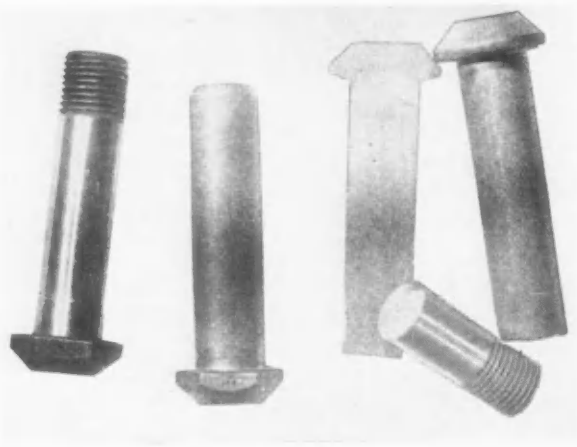

FIG. 2—Photomacrograph with Tessar lens. Full-size cold upset, carburized and ground pin in various stages of manufacture. Headed and trimmed blanks, finished part and fracture.

specimen flat on a 80 P and a 200 M Norton grinding wheel, polish with 600-grain Aloxite on a canvas-covered disk and finally buff with levigated alumina on broadcloth. If a finer buff is desired, a broadcloth disk with jeweler's rouge is used. These disks are 10 in. in diameter and are mounted on the shaft of a motor which revolves at 440 r.p.m.

The most common etching reagents for steel are 3 to 5 per cent nitric acid in alcohol and 5 per cent picric acid in alcohol, known as "nital" and "picral" respectively. It is sometimes difficult to distinguish cementite from ferrite, in which case sodium picrate is used. It darkens cementite but does not etch ferrite. A hydrogen peroxide-sodium hydroxide mixture and hydrochloric and nitric acids in alcohol are used for etching high-speed steel. The latter reagent was used in etching the high-speed steel shown in Fig. 3. This piece was fused in an oxy-acetylene flame. Ammonium peroxide is commonly used in etching brass and other copper alloys. Watch glasses make convenient containers for the etching solutions in use.

Equipment for the dark room should include a work table, sink, a shelf for chemicals and solutions, tank or trays for developing plates and a printing frame. A light, tight ventilator of some sort should be installed. The equipment outlined may be elaborated as necessary, but probably 90 per cent of all the routine work a metallographer is called upon to do could be accomplished without any additional equipment.

A collection of pictures made in the course of a year's ordinary work constitutes a useful and permanent record of good and bad material which may be referred to at a moment's notice. Photomicrographs and plates should be filed by sample number or some other convenient classification. We also keep the polished specimens for four months and the original solid piece of analytical samples for three months.

Some Examples of Findings

Unsatisfactory material can frequently be detected in the raw state, saving the time and expense of processing and finding out too late that it is unsuitable for the required part. For instance, Fig. 4 shows two samples of 0.38 per cent carbon cold-heading wire, one of which split badly when upset. This wire when deep-etched did not show any seams, but the microscope indicates the trouble at once as improper normalizing. The other sample, almost identical in analysis and hardness, heads perfectly.

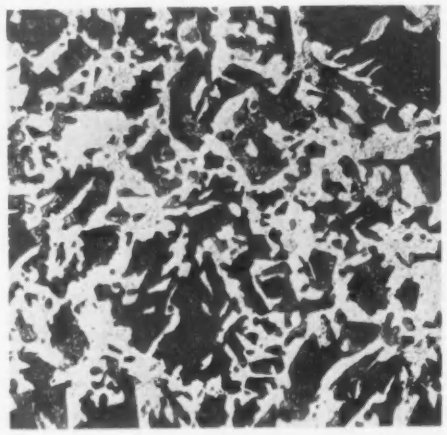

FIG. 4A—Proper normalizing. 100 diameters (Left).

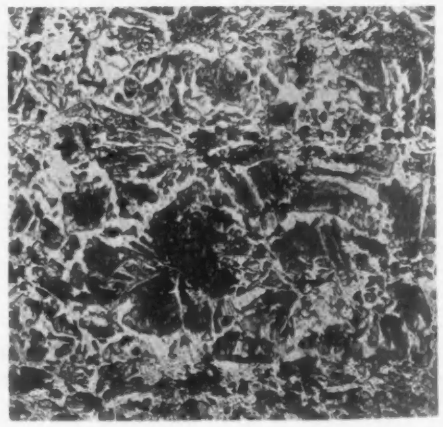

FIG. 4B — Improper normalizing. 100 diameters (Right).

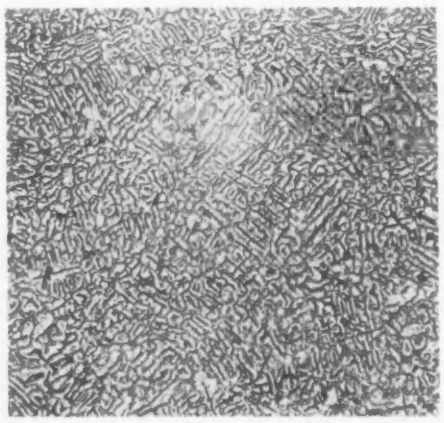

FIG. 3 — Overheated high-speed steel. 100 diameters.

Fig. 5 shows two samples of alloy heading wire of similar type analysis, one of which fills the die and trims with a smooth finish on the head. The other wire, showing a good annealed structure and of the same order of hardness, does not fill the die well and tears badly in trimming.

Fig. 6 tells a graphic story of the cause of a failure. Both samples were deep-etched in hot hydrochloric acid solution and were photographed at 10 diameters. Note the broken flow lines in the one specimen at the point of maximum cold-heading strain, due to recessing the body and shaving too much material from the under side of the head. This bolt should be specified with a fillet, as in 6b, instead of a recess.

Fig. 7 is added to show the difference in resolution obainable with the oil immersion objective. It

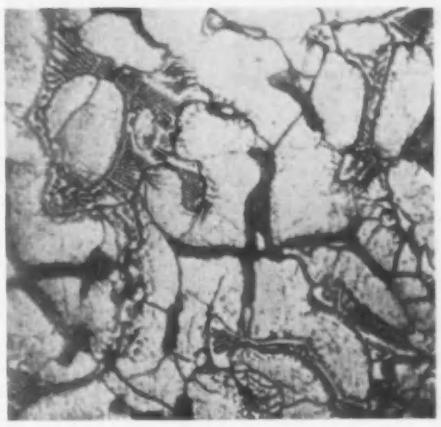

FIG. 7—Same as Fig. 3 but magnified to 1000 diameters.

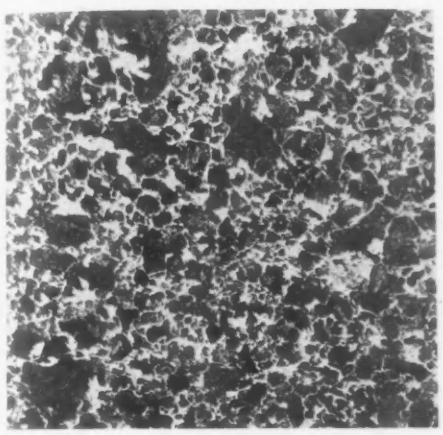

FIG. 5A — Correct structure. 100 diameters (Left).

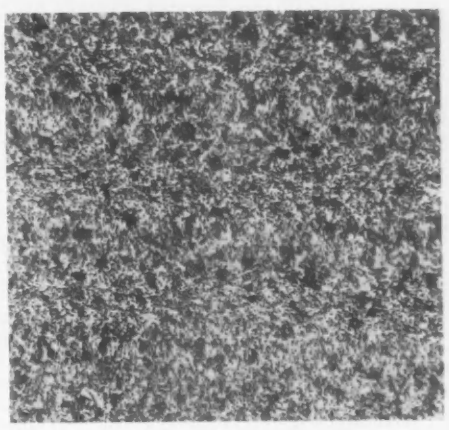

FIG. 5B — Incorrect structure. 100 diameters (Right).

is the same as Fig. 3, but magnified 1000 diameters. A focusing glass is a great convenience for photomicrography, especially at the higher magnifications, where the adjustment is very critical.

We are frequently called upon to make up an order of parts conforming to a sample which is supposedly satisfactory, no analysis or heat treatment being given. With the aid of the microscope and other rapid tests, a history of a piece of steel no larger than a grain of corn can be given with a fair degree of accuracy in less than an hour. The microscope will show whether the part has been made from cold-worked material, whether annealed, quenched or case hardened, and will give an approximate idea of the carbon content in many cases.

Detecting Poor Case Hardening

Case hardened parts frequently fail, due to an excess of undissolved cementite in the hyper-eutectoid portion of the case. This is readily disclosed by the microscope. The depth and character of case must be closely controlled on small parts or those having thin sections. Fig. 8 shows a cyanide case 0.010 in. deep on a small cap screw made of S.A.E. 1015 steel.

Every purchase of steel should be tested when received to determine not only the chemical analysis but also the physical properties. In order to avoid scale on finished parts and to insure greater uniformity of hardness, some steel is purchased "heat-treated in the bar" or quenched and drawn before cold drawing. There is, of course, an extra charge for this treatment and the only positive method of determining whether the proper treatment has been given is with the microscope (see Fig. 9). High-carbon and tough alloy steels are sometimes purchased in the spheroidized condition (Fig. 10) for ease of machining.

Recognizing Dirty Steel

We are beginning to hear a little in recent years, due to more widespread use of the microscope, con-

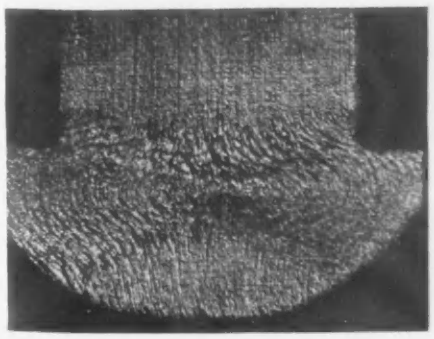

FIG. 6A—Photomacrograph of recess at point of maximum strain. 10 diameters.

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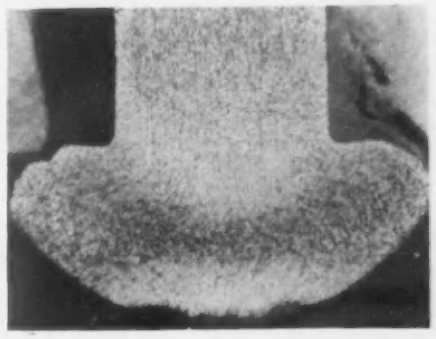


FIG. 6B — Photomacrograph of fillet at shoulder allows smooth flow of metal. 10 diameters.

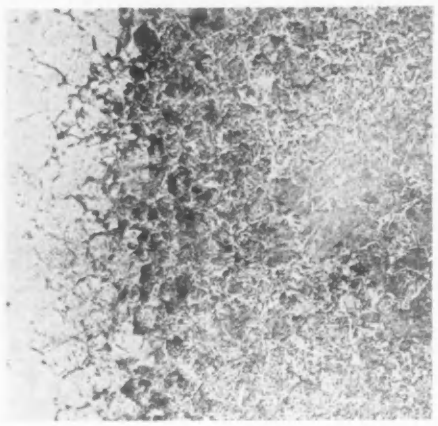


FIG. 8—Cyanide case 0.010 in. deep. 100 diameters.

FIG. 11 — Unetched specimen. 50 diameters, showing dirty steel.

cerning "dirty steel." The phrase was formerly almost taboo. It was passed off as a joke, the inference being that it was used as an alibi to cover faulty practice. However, there is such a thing as dirty steel, witness the photomicrograph, Fig. 11, at 50 diameters unetched. This is not Bessemer steel nor

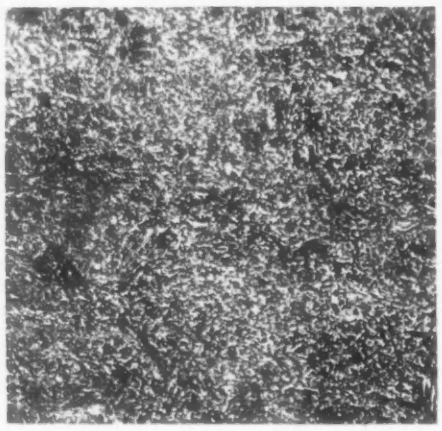


FIG. 9—S. A. E. 3130 steel quenched and drawn before cold drawing. 450 diameters.

rimmed 1010. It is open-hearth steel, conforming to S.A.E. 1035 analysis. As would be expected the physical properties of this material in the heat-treated condition are not very good. The accompanying photomicrograph at 100 diameters, Fig. 12, shows the same piece etched.

All of the above tests may be made with any metallurgical microscope, but there are occasions when it is more convenient to take the microscope to the job instead of bringing the job to the microscope. At such times, the light equipment described is easily portable. We often use it for examining tools which have failed in service due to grinding checks and other defects.

Other Uses for Microscope in Plant

The condensing mirror under the stage fits this instrument for examination of oils, emulsions, fine solids in suspension and other transparent objects by transmitted light, although for cover glass work at high magnifications an objective lens corrected for the bending of the light rays is necessary. We have even used the instrument for examination of bacteria cultures. At one time it was necessary to examine some cutting compound for bacteria in determining the cause of an infection which was becoming troublesome.

In addition to the applications described, there are many uses for the microscope in non-ferrous metallurgy, such as examination of bearing metals, brasses and bronzes and other alloys.

Correlated with chemical analysis and physical tests, the microscope rounds out a complete story of a specimen, explaining, many times, the cause of a defect or irregularity which would otherwise remain unknown.

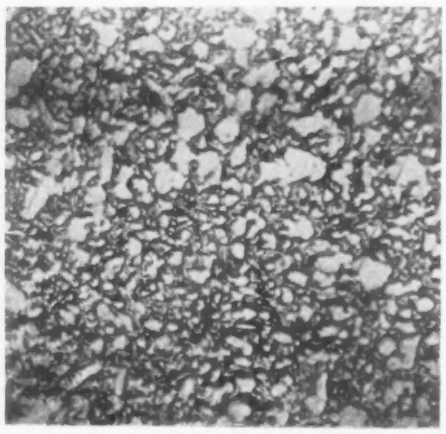


FIG. 10 — Steel with 0.95 per cent carbon and 0.18 per cent vanadium, spheroidized. 1000 diameters.

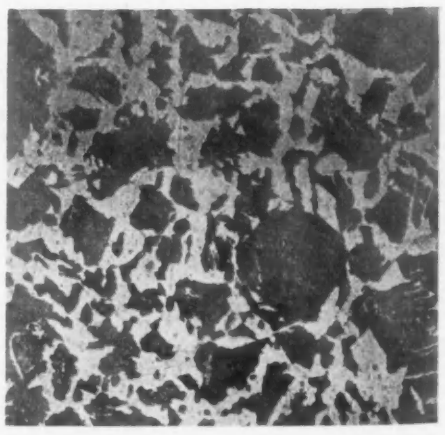


FIG. 12 — Same specimen, as in Fig. 11, etched. 100 diameters.

SPRINGFIELD INDUSTRIES PROVIDE ENTERTAINMENT FOR WORKERS

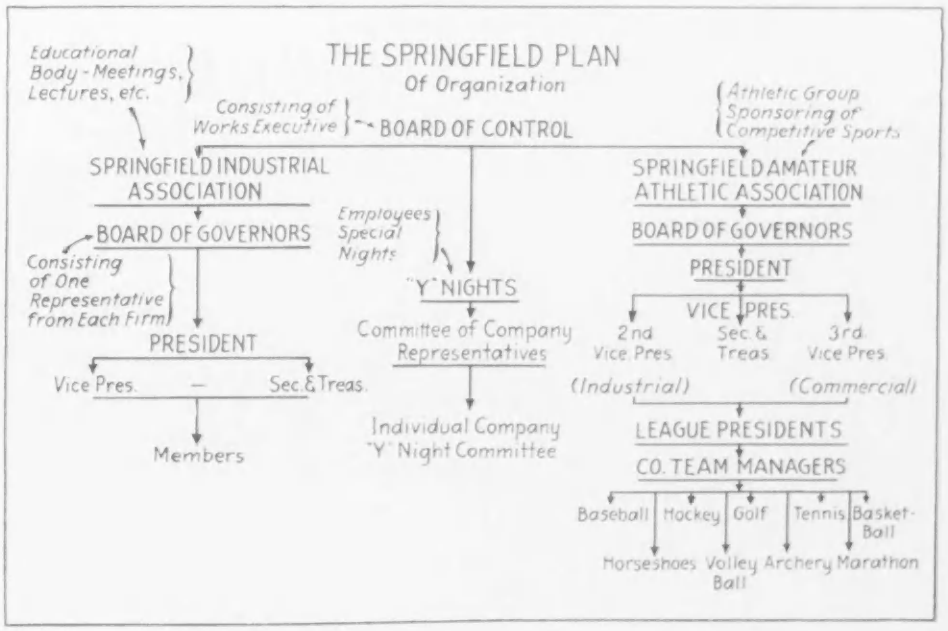
DOES your interest in your workers end with the whistle at the close of the day? Not so in Springfield, Mass., where most of the industrial companies have cooperated to promote educational, social and athletic activities among their employees. Speakers of national prominence are brought to town; baseball, soccer, basketball and other sports are encouraged; and social events, at which executives and their wives fraternize with the employees, combine to develop "esprit de corps." This article tells how the Springfield programs are organized and how they work out.

By J. W MARSHALL

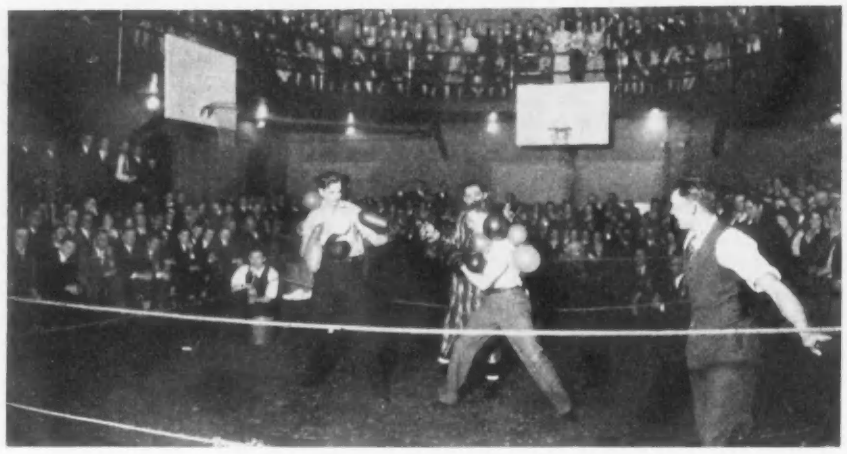
BELIEVING that the health and contentment of workers are factors as vital to good workmanship as technical ability, the industrial managers of Springfield, Mass., have developed programs for both physical relaxation and educational development, nearly all of the leading manufacturers of that city cooperating in the plan, which functions through three separate channels—the Springfield Industrial Association, the Springfield Amateur Athletic Association and what are known as "Y" nights.

The Springfield Industrial Association has for its purpose the bringing to Springfield of speakers with worth-while inspirational and industrial messages. Its organization was perfected through the industrial department of the Young Men's Christian Association.

The industrial association is controlled by a board of governors consisting of one representative from each of the following companies: Gilbert & Barker Mfg. Co., United States Envelope Co., Chapman Valve Co., Standard Electric Time Co., Westinghouse Electric & Mfg. Co., Wico Electric Co., Boston & Albany Railroad, Strathmore Paper Co., United Electric Light Co., Diamond Match Co., Bay State Thread Co., Fiberloid Corpn., Fisk Rubber Co., Stev-

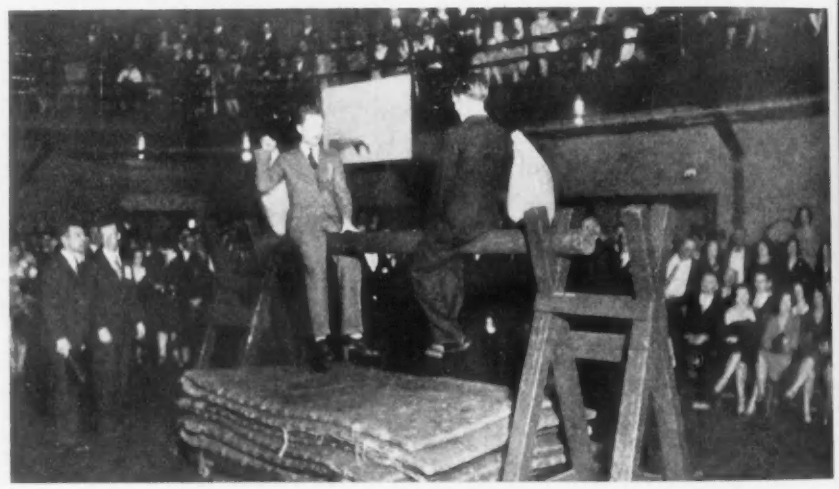


Plan of organization of Springfield industries for education and entertainment of workers.



ens Arms Co., Springfield Gas Light Co., Ludlow Mfg. Co., Package Machinery Co., United American Bosch Co., and Perkins Machine & Gear Co.

Those eligible to membership in the association consist of those connected with the plants represented by the board of governors and who show promise of leadership, usually of men of the rank of sub-foreman or higher. The membership is secured through the representative on the board. The annual charge for membership is $2 and the meetings are held on the first Tuesday of every month. Some of the plants require those attending the courses to pay the annual charge themselves, while others refund the whole or half of the amount to those who have satisfactorily attended the meetings. The $2 charge covers the expense of securing high-grade speakers, the rental of the hall and incidental expenses.



Social evenings for the workers of Springfield plants comprise a number of activities.

Speakers of National Reputation

The speakers secured for the meetings are men of national reputation, such as Dean D. S. Kimball, of Cornell University; Chancellor Charles Flint, of Syracuse University; Henry Dennison, of the Dennison Mfg. Co.; Arthur Young, of the Industrial Relations Counsellors, New York; Cameron Beck, personnel director of the New York Stock Exchange, and T. C. Carver, professor of economics, Harvard University. Occasionally through the course of the scheduled program, when national speakers connected with companies forming part of the association are on the program, booster nights are held at which the members of that company take part in the program. At the end of the speaking course, late in the spring, an annual banquet is held for the members of the association and invited friends. This banquet serves to sum up the results of the year's work.

The social or "Y" nights could be called winter picnics. The programs of the "Y" nights are made up by the company employees themselves and consist of entertainment of a general nature and competitive games. These social nights are usually opened by a spirited talk by some executive and are held either at the Y. M. C. A. building or at some hall large enough for such activity. At times as many as 3000 persons have taken part in some of these gatherings.

The money to defray expenses is either donated by the companies, by the athletic associations or by the sale of tickets for a nominal sum. At the "Y" nights the foremen and officials mix with the workmen on equal terms, the wives of the executives and the wives of the workers participate in games and otherwise get acquainted.

Physical fitness, play, and health are introduced into the life of industrial Springfield through the Springfield Athletic Association. This Association consists of more than 40 Springfield industries and commercial houses. It is controlled by a board of governors consisting of one representative from each plant. Usually each company organizes its own ath-

letic association, which controls the recreational and athletic activities of that company. The success of this organization is due in part to the fact that it is entirely independent of the company officials, who have no control over its management. The organization consists of a group of men and women who represent the employees in each plant.

From this body several officers are elected each year. A president, three vice-presidents, a secretary and treasurer, and a board of directors. This group of officials forms the parent body of the association. Each member of this body is responsible to see that the affairs of the association are kept alive, and that something is going on in the various fields of sport among the employees of their companies. Working in cooperation with this board of directors are several league presidents, who head up the various leagues, and who are particularly interested in a major sport. These leagues are formed each year among the various employees of the industrial and commercial houses, the governing bodies of which are the managers of the company teams. Any sport is considered by the association, providing there is enough interest among the industrial and commercial houses to form a league.

such as boxing, tugs of war, balloon blowing contests and other appropriate games.

The association has promoted many sports, including baseball, soccer, basketball, bowling, archery, tennis, golf, hockey and horseshoes.

The membership fee for any industrial or commercial house is $5 a year. This entitles the company to participate in any of the activities of the association. This fee also permits the member to have a representative on the board of directors. Any industrial plant or commercial house which employs labor is eligible to membership.

In addition to providing both recreation and exercise for large numbers of the employees, these activities go a long way toward inculcating good industrial spirit, as evidenced by the fact that some of the games are attended by as many as 2500 persons.

The aim of the Springfield plan is to take care of the leisure time of the industrial men and women of the city. As one company puts it, "All the things we do for our employees do not net us a tangible or immediate cash return; but we do feel that our attempts to create interest and loyalty on the part of the employee pay us dividends that can be expressed in dollars and cents profit."

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Economic Reports

AS a part of its service to group insurance policy holders, the Metropolitan Life Insurance Co. has made many studies in economic and engineering lines, and has issued reports covering them. An index of the economic reports, in a pamphlet of 60 pages, has been put out by the company, classified according to major divisions of management and further classified by the type of business involved.

Machinery, metals and metal products, one of the industrial divisions quoted, has 27 reports listed, of which a number, relating to foundry practice, formed the basis of a series of articles in THE IRON AGE in 1924 and 1925.

MODERNIZING OVEN EQUIPMENT

By PHILIP KRIEGEL

OVENS for drying, and for baking enameled, japanned and painted metal parts have been developed to a high degree. When of automatic conveyor type they permit continuous processing, speeding up production, as well as reducing labor, floor space and heat requirements. Specific examples of such economies are given in this article which covers equipment for baking wire and the finishes on automobile wheels, bed springs, portable tools, electrical stampings and other parts.

IN the face of economic readjustment it becomes important to analyze the production facilities and methods of industrial establishments to bring the cost of manufacture in line with lower selling price. Should the volume of American products increase to even as much as that during the peak of the last "prosperity era," the tendency toward lower prices than heretofore is inevitable. The need for operation on a profitable basis, therefore, requires more efficient and more economical production through modernized equipment to reduce manufacturing costs to a minimum.

The application of industrial ovens in miscellaneous drying and baking of metal products illustrates concretely how the coordination of suitable methods of materials handling, fuel selection and heat utilization has led to production efficiencies which have proved the wisdom of investing in such equipment. Whatever may have been regarded as satisfactory performance under existing conditions, careful preliminary study and subsequent design have uncovered means whereby the costs of manufacture could be reduced through reorganized processing, better production control, conserved floor space, faster operation, less waste, less moving inventory, lower fuel costs and improved quality of product.

Time, Fuel and Labor Saved in Baking Wire

In wire manufacture an important operation is the baking of bundles of wire which have just been dipped in the lime solution. This is done to remove acid brittleness which may be caused by immersion in the pickling solution after annealing and to provide a lubrication medium for the wire in the next drawing operation. The practice has been, and to a great extent still is, to load the wire bundles on racks or on hooks from overhead tracks, push them into large brick ovens and submit them to a heat from 6-to 10 hr., depending upon the weight of load and gage of wire. The introduction of an indirect system of heating, utilizing whatever fuel is found most economical, combined with a unique method of warm air circulation, has effected unusual results. In one plant, producing a wide variety of fabricated wire and cable, cost figures indicate that the new installation had speeded up the baking time from 6 hr. to an average of 1 hr., and with the greater hourly output, the amount of floor space required was reduced by 80 per cent. Fuel savings amounted to 30 per cent and labor savings, due to constant employment of workers assigned to the operation, were 50 per cent. Eliminating the old difficulty of product accumulation at the ovens and the so-called "rest periods," the flow of work from the lime baths, through the ovens and to the draw benches has been synchronized so that the entire production cycle has been considerably shortened.

Continuous Baking of Enameled Wheels and Tire Rims

When the air dry finish on automobile wheels and tire rims was abandoned in favor of a baked enamel finish, the management of one of the largest plants was confronted with the problem of handling the cleaning and finishing of stamped parts continuously. To have adopted the possibly less expensive expedient of installing truck loading ovens and separate cleaning and paint dipping machines would have destroyed the first requirement of straight-line production consistent with minimum handling and time. Conveyorizing the entire finishing room operation solved the entire problem.

The work is suspended from hooks on a chain-trolley system riding on a single track and is carried without interruption at a definite predetermined rate of speed first through the cleaning and rinsing tanks, then through a rust-proofing solution, drying, into an enamel dip tank, over a drain board to permit excess enamel to be removed, and into the oven for baking.

The oven itself is 185 ft. long and the conveyor carries the work in four parallel passes through the preheating, heating and cooling zones for a total distance therein of about 700 ft. From the oven, the conveyor moves directly to the loading platform, where the rims and wheels are packed and made ready for shipment. The steady flow of material

NT LEADS TO COST REDUCTIONS

from the last stamping operation to the packing is evidence of the integrated production, leading to lower manufacturing costs which could never have been otherwise realized. Not a single manual operation is required in the entire cycle for any of the many processes. Whatever labor is required is devoted only to keeping the fluid tanks filled and clean, starting and lubricating the equipment.

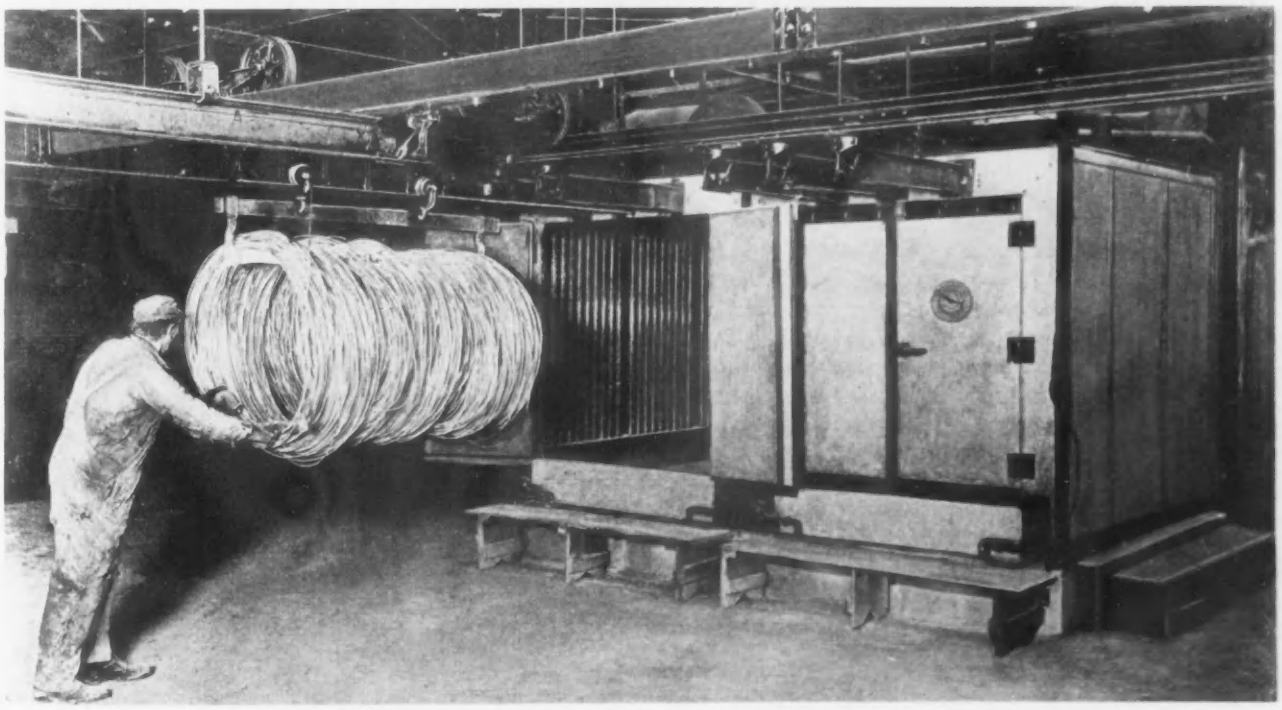
Conveyors and Baking Oven Shorten Portable Tool Production Time

An example of cost reduction to be gained from conservation of floor space is evidenced by a typical case in the manufacture of portable electric and hand tools. In one large plant the production of all tool parts and assembly has always been on a continuous flow basis, that is, up to the final testing and paint finishing operation. At this point, because of the use of an air dry finish which required from 12 to 14 hr. to dry properly, considerable floor space was required to accommodate the mounting supply of finished tools.

By the adoption of a gravity roller system, combined with spraying and a baking oven, it is now possible to test, finish and dry the work in one-third the former time. This permits the major portion of the work to be assembled, tested, finished, packed and shipped the same day. The tools on boards slide down the gravity rollers, are connected to a power supply, and the motors are run and tested while moving on the conveyor. They are then sprayed and moved through a long roller conveyor oven, heated by electricity. The work emerges at the other end, with the enamel thoroughly dry, ready for packing. It has been definitely established that conveyorizing this finishing operation and using an oven for speeding up the drying have reduced floor space requirements to about one-fourth of that formerly required.

Continuous Conveyor Oven Advances Brake Lining Curing Process

Manufacturers of brake lining have been quick to see the need of modernizing their equipment. This has been particularly true with respect to the important so-called curing operation once requiring considerable expensive processing time and labor. The usual practice for a long time has been to load the chemically treated rolls of brake lining on trays



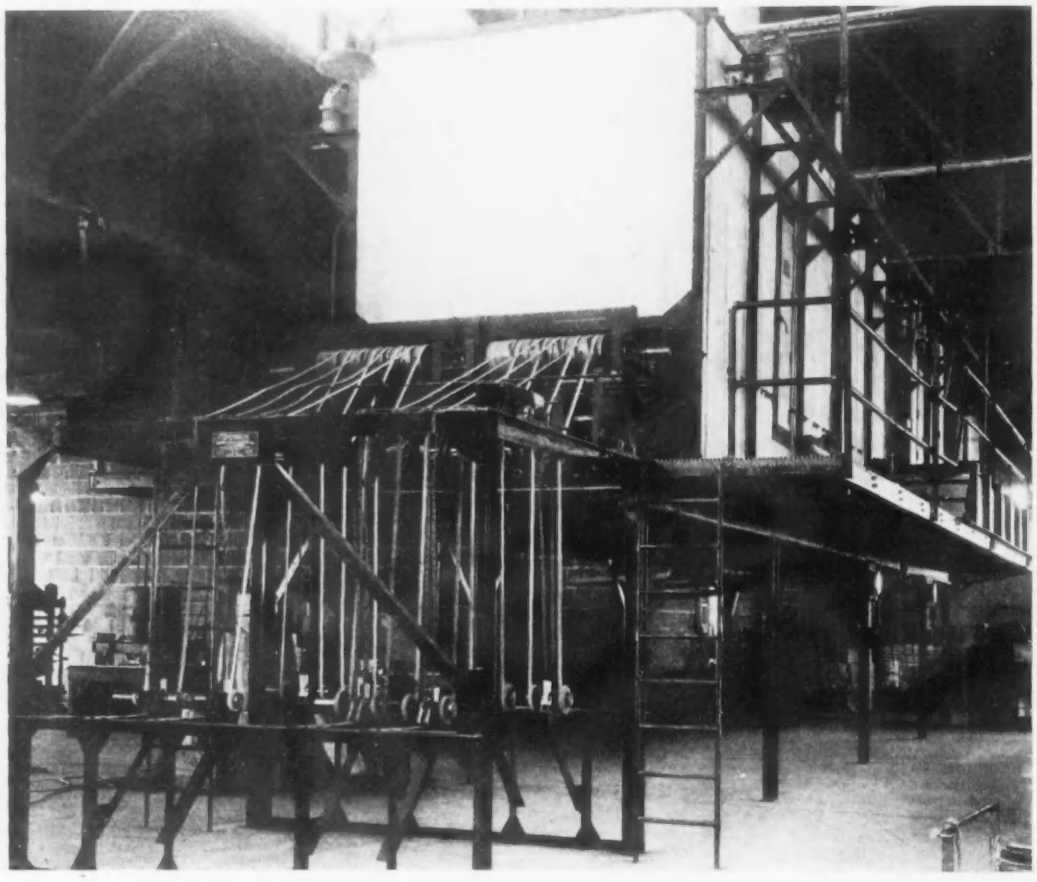
After being dipped in lime, the bundles of wire are baked in this type of oven. The baking time is one-sixth of what it was formerly; floor space and labor have been reduced and the baking has been synchronized with preceding and succeeding processes.

of trucks which in turn are pushed into electric or gas-heated ovens to cause complete impregation of the tape and the removal of the volatile vapors. The removal of these trucks, likewise manual, requires pushing of the trucks to different parts of the plant.

With the development of the automatic, continuous conveyor oven for this industry came a decided advance in the curing process, which has effected sufficient economy in production to pay for the investment in the new equipment in the first few months of operation. The oven consists of a feed end, preheat oven, dipping section, drying oven and unloading or rewinding section. As many as 16 strands of lining of varying widths and thickness may be put through the process simultaneously, being guided through the preheat, dip and drying continuously, automatically, at a definite predetermined rate of travel and subjected to definite controlled temperatures. The ovens are built of insulated, dual panels and are provided with ventilation facilities to remove moisture and volatile vapors from the wet lining. The source of heat is external to the ovens themselves, supplying an adequate quantity of clean, hot air through ducts to the ovens.

It is to be observed that whereas with the hand-operated, truck loading ovens it is necessary to take care of a number of trucks in and out of a battery of ovens, each often at a different temperature and time cycle, the conveyor oven requires one man to splice the rolls of tape to the preceding strips and one man to remove the rewound rolls at the unloading end. All variables in time and temperature of treatment are eliminated which, of course, is impossible with box-type ovens frequently opened for reloading. The work, therefore, is uniformly treated at all times.

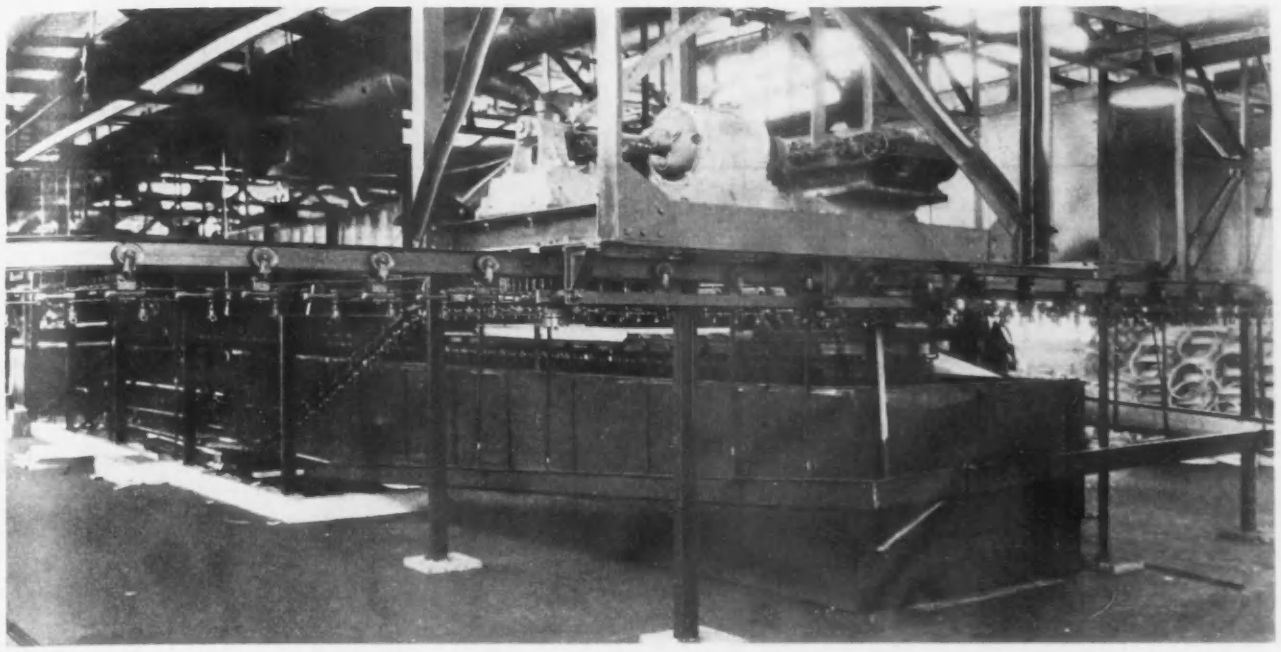
The actual amount of space required for this conveyorized system of curing is considerably less; moreover, where height permits and it is possible to mount the equipment on structural members above floor level, practically all of the floor space is made available for other productive purposes. The heating cost is from one-half to two-thirds of that with a battery of truck loading ovens. An installation such as the one shown, with an overall length of about 60 ft., will produce a total of 4800 lin. ft. of lining of varying sizes per hour, ready for calendering, trademarking and packing. There is a great reduction in labor required and consequent supervisory effort, with the work flowing through the curing treatment continuously, smoothly, steadily, in perfect coordination with preliminary and subsequent operations set to meet the pace of this foolproof machine.



THE curing operation in making brake linings has been advanced by the automatic continuous conveyor oven. Producing 4800 ft. of lining of various sizes hourly, the equipment reduces labor, heat and space requirements and provides suitable coordination with preliminary and subsequent operations.

Bed Springs Undergo Tempering and Japanning Simultaneously

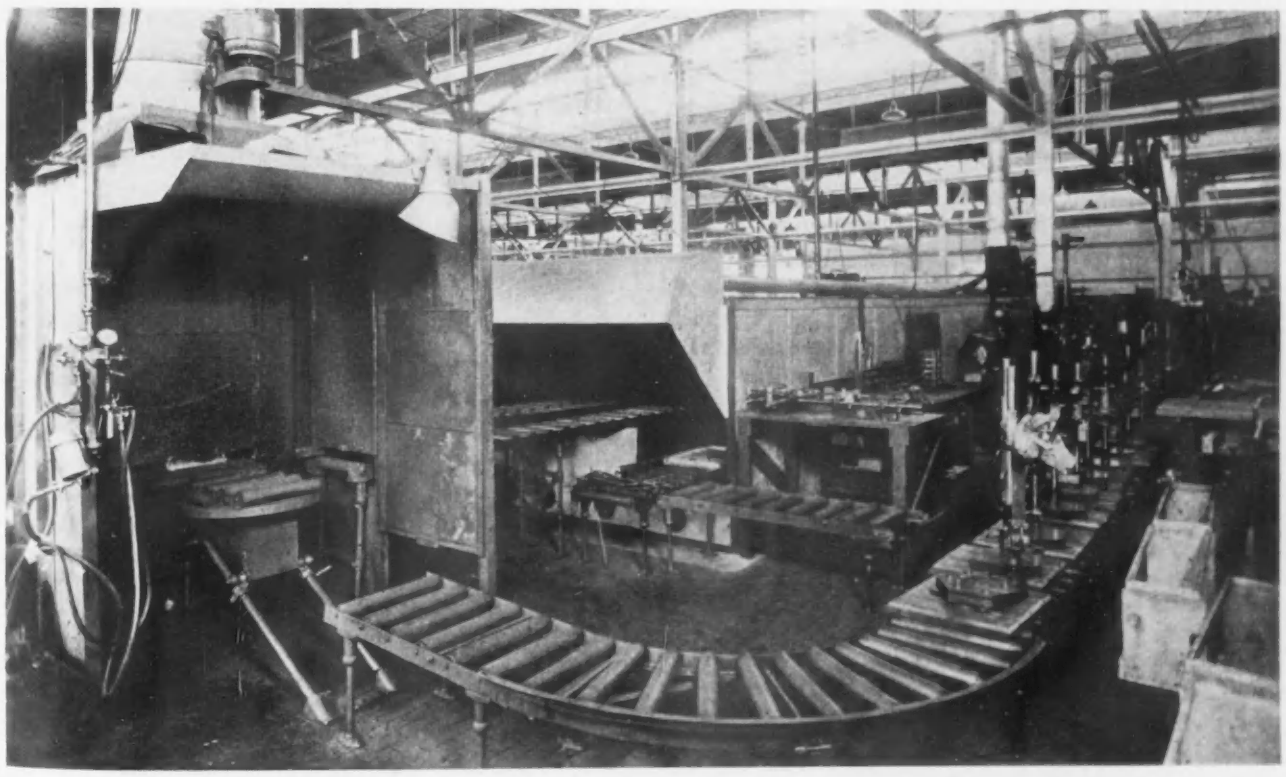
Use of conveying systems in the manufacture of bed, cushion and couch springs extends further back than in many other industries. These for the most



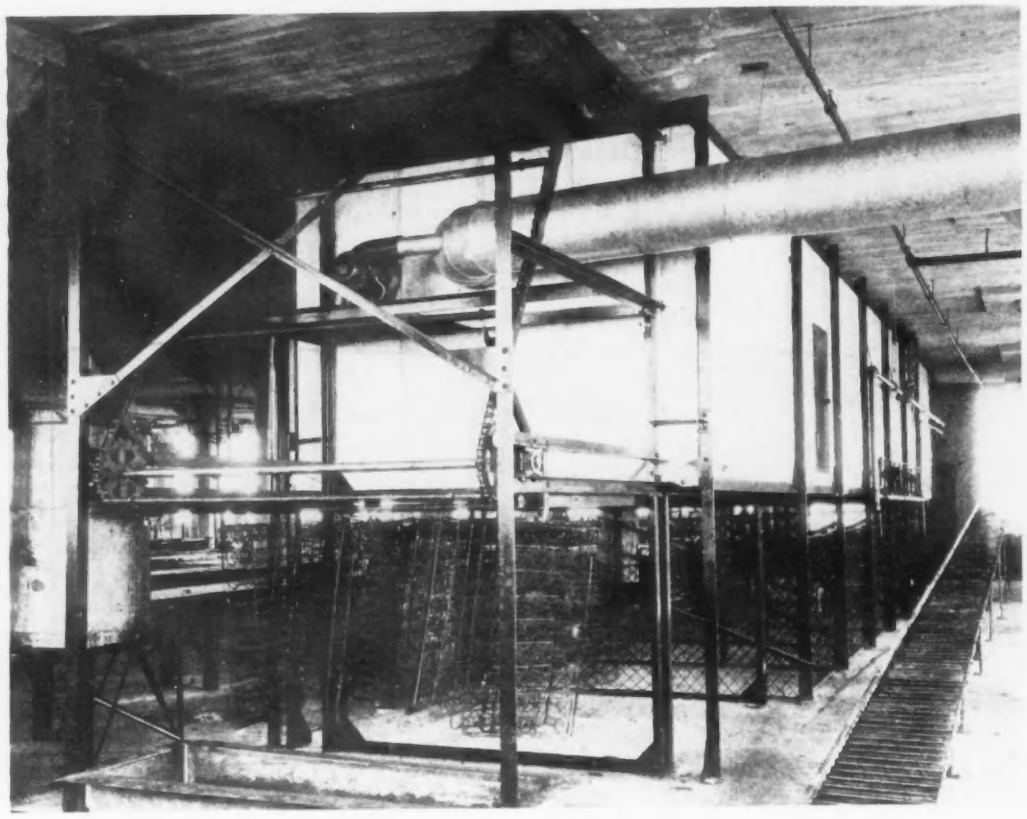
Automobile wheels and tire rims, carried by conveyors, are cleaned, rinsed, rust-proofed, dried, enamel-dipped, drained and carried into the baking oven. From the oven they move directly to the packing and shipping department. Not a single manual operation is required.

part have been of the overhead-track type from which are suspended the springs to be carried from one part of the plant to another or through an oven for finishing; for helical or small assembled springs tempering is carried out in flat conveyor ovens or truck loaded box-type ovens. Each operation is accomplished separately, first tempering, then japanning, involving considerable total time.

Some manufacturers have adopted a conveyor-oven system whereby the tempering and japanning operations take place simultaneously, by the use of a special finish which can withstand the tempering temperature without blistering. The springs, be they complete bed springs, couch or seat springs or bunches of spirals or helicals, are suspended from the cross flights of a chain conveyor which lowers the



A gravity roller system combined with spraying and a baking oven permits testing, finishing and drying the portable electric hand tools in one-third the former time. Floor space requirements have been materially reduced.



USING a conveyor oven and a special finish that can withstand the tempering heat without blistering, bed, couch and seat springs are tempered and japanned simultaneously. In addition to other marked economies, the production cycle has been shortened.

work into an enamel dip tank, then over a drain section for removal of excess enamel and into the oven where the conveyor at a definite rate of speed carries the work through the preheating, combined baking and tempering and finally, the cooling zone, to emerge for unloading at the opposite end of the oven. Combining the separate tempering and finishing operations into one has halved the cost of fuel, oven requirements and time, and reduced appreciably the attendant labor and oven floor space, shortening the production cycle and making possible a reduction of stock in process and quicker deliveries.

Use Improved Oven Equipment in Making Electrical Cut-Out and Junction Boxes

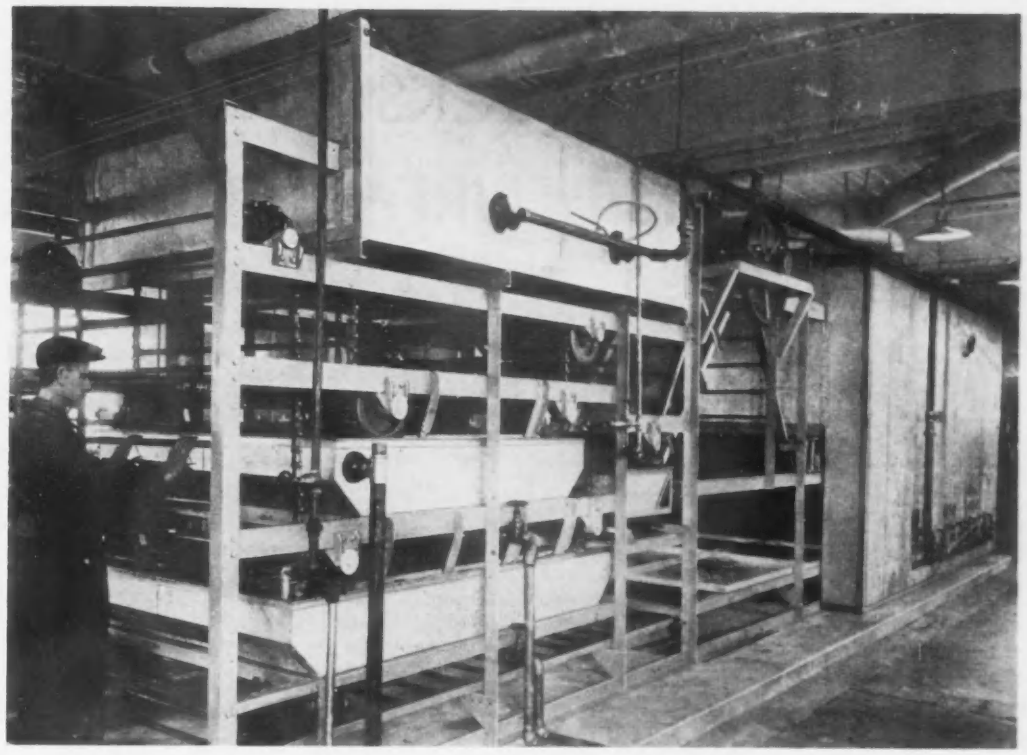
The electrical industry has been notably progressive in applying improved oven equipment, the larger establishments readily adopting handling and heating systems that have provided extraordinary efficiency in production. The use particularly of conveyors in the manufacture of motors, transformers, switch boxes, refrigerators and other products and electrical parts has consistently contributed to lower prices for better products. An example of such modernization, here illustrated, applies to a representative installation in finishing junction and cut-out boxes and parts.

Prior to the installation of this conveyor oven arrangement, the metal stampings comprising the boxes were first cleaned in special tanks, then carried to a rinse and finally through a dryer to prepare the work for the japan. This was then applied, the pieces loaded on trucks and run into ovens for baking. All these operations required separate apparatus, considerable floor space, many handlings and lost motion in moving the work from one operation to the next.

A conveyorized cleaning and baking system replaced all of this and immediately produced striking results. This new mechanism embraces a two-strand chain conveyor with cross-bars upon which the work is hung. The conveyor first travels downward into a caustic solution tank, where the oil, grease and grime is removed by the agitated liquid. It then takes the metal pieces up into a rinse tank where the last traces of muck and alkali film are removed.

Thence the conveyor travels up into a gas-heated dryer to remove all moisture. From this triple-tier cleaning arrangement the work is moved into a japan dip tank, slowly withdrawn, allowed to drip over a drain board, which carries the excess japan back into the tank, and conveyed through a heat seal into a steel paneled, gas heated oven. There the conveyor makes a number of vertical passes to allow the japanned parts to bake thoroughly, emerging at the other end of the oven to return under the entire operating structure to the original position, for unloading of clean, cool, finished work and reloading of dirty pieces.

In the old way eight men were required for cleaning, handling, dipping, pushing the trucks and watching the oven; now only two men or girls are needed to hang the pieces on the bars. Properly regulated filling and discharge of cleaning tanks, keeps them at correct cleaning effectiveness. Automatic dipping at a definite rate avoids waste of japan which was inherent in hand dipping. Elimination of opening and closing of oven doors has produced



FORMERLY the stampings comprising the cut-out boxes were cleaned in special tanks, then carried to a rinse and put through a dryer. They were then japanned, loaded on trucks and run into bake ovens. A continuous conveyorized cleaning and baking system is now employed with striking results.

economy in fuel. All of these cleaning and finishing operations have been coordinated and idle time eliminated through continuous flow of the process. Moreover, definite regulation of speed, time and temperature has produced more uniform and better parts.

The illustrations with this article are from photographs furnished by courtesy of the Gehnrich Oven Co., Long Island City, New York.

Compares Tungsten and Tantalum Carbide Cutting Tools

A DEVELOPMENT originating in Germany, while apparently holding out no possibility whatever for tonnage, seems to be of great interest to us, because of its indirect effect on our steel industry, said H. G. Batcheller, president, Ludlum Steel Co., Watervliet, N. Y., in an address recently before the New York section of the American Institute of Mining and Metallurgical Engineers. It has been said that high-speed steel won the war. This, of course, is not true and yet it can quickly be realized after some thought that the guns, projectiles, etc., which did win the war, could hardly have been turned out in winning quantities without the use of this cutting metal. While there have been some improvements in high-speed steel, no radical changes have been made during the many years since it was invented.

A few years ago a small group of German metallurgists succeeded in making some tools of tungsten carbide (which of itself is too weak and porous for commercial use) by adding cobalt as a binder, the addition of from 6 to 13 per cent of cobalt making the product about half as strong as high-speed steel and still capable of scratching a sapphire. In this case also several American investigators were working along much the same lines as the Germans. The contributions of the two groups being combined, the so-called tungsten carbide was quickly introduced in the United States where it has established new records for wire-drawing dies, tools for cutting cast iron and the non-ferrous metals, bakelite, hard rubber, etc.

Tungsten-carbide tools proved to be a disappointment when used for the cutting of steel because the high tool pressure, due to the strength and toughness of steel as compared with the non-ferrous metals, caused failures.

Recently, however, the persistence and genius of research engineers connected with one of our large manufacturers of electrical equipment have succeeded in producing a carbide of tantalum considerably tougher than the tungsten carbide. This tantalum carbide made into cutting tools recently performed satisfactorily when tested on steel at a speed 40 per cent in excess of the limit for a high-speed tool, the same cut being taken in both instances. Apparently the tantalum carbide tool could have functioned at even a much higher speed had the capacity of the machine permitted. The life of such tools between grinds has been estimated at from 20 to 30 times the life of high-speed tools. The power input to the machine is apparently less and the tools appear to be largely self-lubricating.

Here is an excellent example of the indirect benefit to the steel industry from metallurgical investigation, it being obvious that anything that reduces the cost of the products manufactured from steel broadens the market for the raw material, Mr. Batcheller said.

MAGNETIC CHUCKS KEEP PACE WITH MODERN SURFACE GRINDERS

By F. L. SIMMONS
Engineer, Taft-Peirce Mfg. Co.,
Woonsocket, R. I.

BUILDERS and users of high-speed surface grinders have long recognized the advantages and flexibility of the invisible magnetic field for holding magnetic materials, usually iron or steel, while being ground. Its chief advantage when built into a chuck is that a great variety of work can be handled without resetting or loss of time through the repeated clamping necessary where mechanical fixtures are used.

In recent years, however, the demand has been for greater speeds, feeds and cuts—in a word, greater production—and this has been met with new high-speed hydraulic grinding machines. With the advent of this more highly productive machine equipment came new demands on the makers of magnetic chucks.

One chuck developed to meet the more severe modern requirements is the unit illustrated, a new product of the Taft-Peirce Mfg. Co. which is claimed to be fully covered by patents issued or pending. This chuck was designed primarily to produce over a maximum of magnetic working area the greatest possible gripping power. An important feature of the design is that variation in holding power over the entire working face has been kept within a 5 per cent limit.

The increase in magnetic area over the conventional form of chuck is shown in Fig. 1, the area within the white dotted lines being that of the new chuck. This increase was achieved by the development of a finer mesh magnetic work-plate, *A*, shown in Fig. 2, with narrow pole pieces which will hold small as well as large pieces firmly in contact with the chuck. The main poles of the chuck, *N* and *S*, are spaced as alternately north and south poles. They are magnetized by coils connected to a direct-current line. Pole pieces *n* and *s* are bolted directly to the main poles, the face surface of each pole piece being cut away to leave two pole faces exposed on the work-plate. This arrangement provided two south poles and two north poles in the working face for each south and north pole energized in the chuck. The working poles on the magnetic plate are thus arranged in the order *n*, *n*, *s*, *s*, *n*, *n*, *s*, *s*, etc.

The magnetic flux therefore flows from each set of two north poles to the set of two south poles immediately adjacent. It also flows from all *n* poles to the adjacent *s* poles. The grid formations *b*, of the work-plate frame extend between the adjacent edges of all poles of opposite polarity and also pass through the recessed portions of all individual pole pieces, *n*, *s*. The gaps between the grid formations and the pole pieces are filled with a non-magnetic material *c*, which is condensed to produce a solid mechanically constructed work-plate.

The main poles and coils are of such capacity that more flux is generated in them than can be absorbed by the work-plate pole pieces, *n* and *s*. The arrangement is therefore such that the entire surface of each set of two north and two south pole faces, including the unpolarized sections *b*,

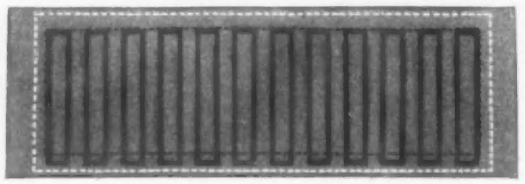
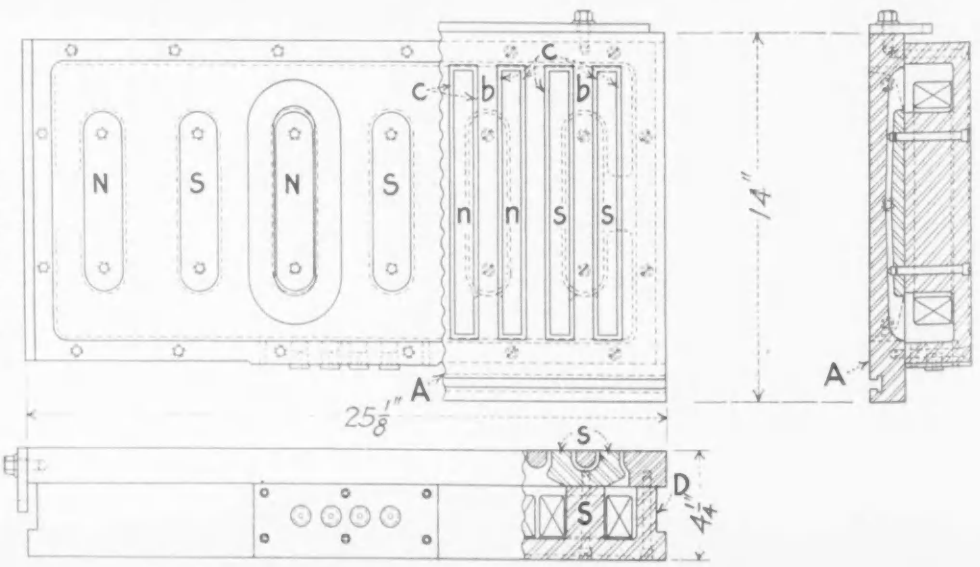


FIG. 1. (At left)—The increased magnetic area shown by the dotted white lines was made possible by the combination of a fine mesh chuck work-plate, the unique grid formation in the work-plate frame and a new type of work-plate pole piece.

FIG. 2. (At right)—The chuck work-plate has narrow pole pieces which firmly grip small as well as large work. Two south pole faces and two north pole faces are provided in the working face for each south and north pole energized in the chuck.



embedded in them, acts as a magnet. The degree of holding power produced by this arrangement is reflected in the set-up shown in Fig. 3, in which the magnetic flux is shown bending a ¼ x 2 x 17½-in. cold-rolled steel bar supported at each end by cardboard blocks. When two ½-in. square steel parallels are placed on the chuck and another bar laid across them, the latter, when the chuck is magnetized, will support a 25-lb. weight 8 in. from the overhanging end of the bar.

It should be noted that the new design also eliminates the use of the chuck body walls, *D*, as south poles, with the result that leakage of magnetism from the chuck into the machine table is effectively prevented.

Recently developed hydraulic surface grinders travel at a much higher rate of speed, take heavier cuts, and use a greater amount of coolant than mechanically-operated grinders. This chuck has been developed to meet these modern grinder conditions; it not only has great gripping power but is both watertight and airtight. The body is filled and sealed with an inert non-inflammable material which combines all interior elements into a single immovable unit, preventing them from shifting or chafing while the table is reciprocating. Additional protection against moisture is provided by a thin metal gasket between the top surface of the chuck body and the faceplate..

As might be expected with chucks operating at high wattage, line surge, due to the collapse of the magnetic field when the circuit is opened, becomes a factor in the larger sizes. The voltage surge in the coils, built up instantaneously to several times the normal operating voltage, is of only a moment's duration, but when repeated continually it may cause coil puncture. To limit it to a harmless intensity, this surge is caused to be dissipated through resistors, incorporated in the base of a special field discharge switch claimed to be a patented feature.

In using the chuck for light cuts on very thin work, the work may be placed on the face plate, the circuit closed and then promptly re-opened without demagnetizing the plate. The residual magnetism will frequently be sufficient to hold the work. Light cuts only should be taken, and the work should be turned over after each cut, alternate sides being ground successively, until the spring is taken out of the work. When making very heavy cuts, especially on planers and the like, it is desirable to use end stops. The smoother the surface in contact with the faceplate, the better, of course, are the holding qualities.

Although the magnetic material used in this chuck is of the lowest carbon content available, there is a tendency for certain kinds of work, such as tool steels, to stick to the chuck after the electric circuit has been opened, due to the residual magnetism characteristic of all magnetic fields. Thus it is necessary to demagnetize the chuck by momentarily reversing the direction of the current and again opening the circuit. This is accomplished by means of a double-pole double-throw switch which the operator soon learns to manipulate. Magnetic chuck switches do not demagnetize the work. They merely free the faceplate of residual magnetism so that the work can be removed. Demagnetizers are employed where all traces of magnetism must be removed from the work as in watch parts, etc. The work has merely to be passed across the top plate of the demagnetizer in which an alternating

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FIG. 3. (At right)—The degree of holding power is indicated by the bending of a steel bar supported on cardboard blocks at each end.

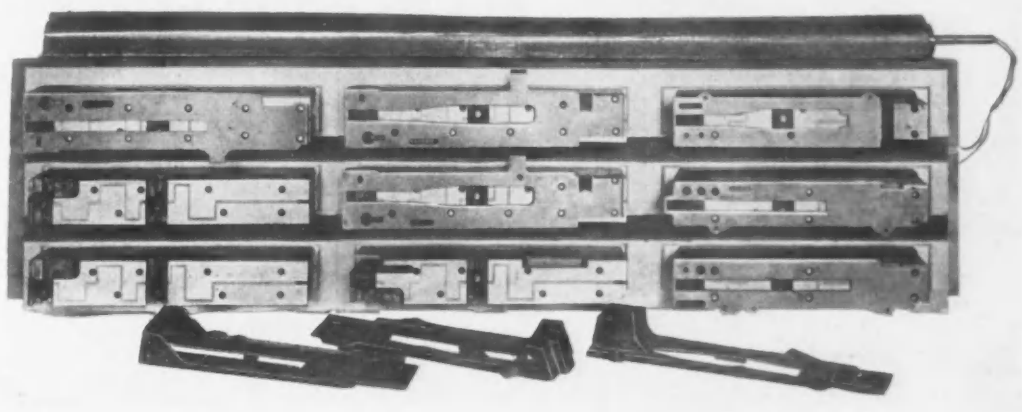

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FIG. 5. (Below)—The magnetic chuck shown in Fig. 4 measures 24 x 84 in. and is mounted on the cast iron angle plate shown in this view.

FIG. 4. (Above)—Magnetic chuck used for grinding layends on a face grinder. The layend castings are 18 in. long, 4 in. wide and 6 in. high. Nine are ground at one time by holding them magnetically on auxiliary pole piece extensions attached to the face of the chuck.

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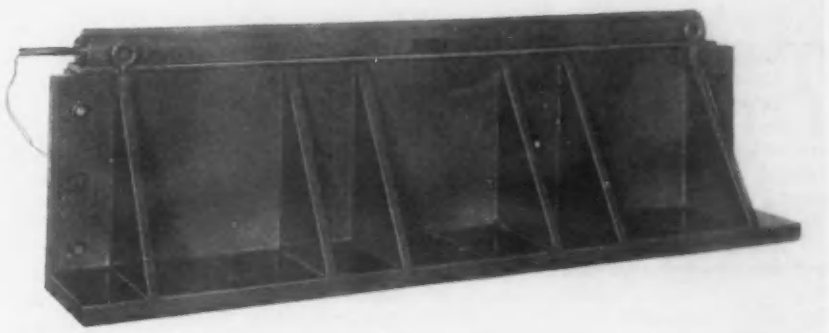
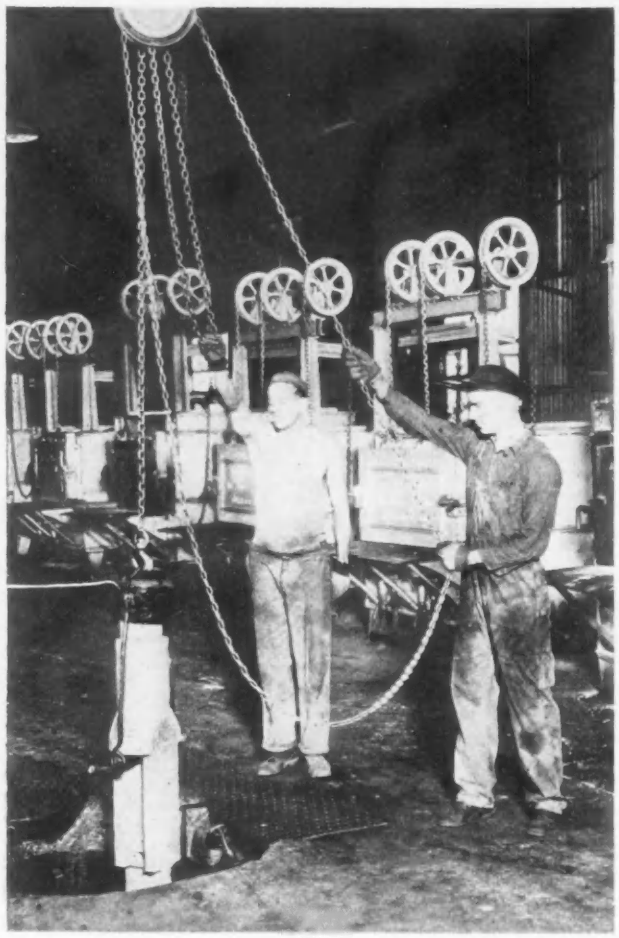




DRILL bits being lowered into a quenching medium.

OIL WELL DRILL TOOLS MUST STAND HARD USAGE

By J. B. NEALEY
American Gas Association

THE relationship between accurate heat treating and the equipment employed is today so close that the former is quite dependent upon the latter. Absolute control of temperature cycles, time cycles, furnace atmospheres, etc., is necessary and can only be obtained by correct furnace design, proper fuel and its carefully regulated combustion. All of these factors enter into the heat treatment of oil well drill tools, which are notorious for the hard usage they must withstand.

All of these factors and many more were considered when choosing the furnaces and developing the heat-treating schedules for the plant of the Guiberson Corpn., Dallas, Tex. This company manufactures oil well supplies, including disk bits, tubing catchers, swabs, packers, oil savers, and also internal combustion engines. The furnaces are pretty well standardized as to construction details and can be used interchangeably for nearly all kinds of heat treatment. The heat-treating room layout, including furnaces, air and gas lines, boosters, quenchers, hoists, etc., provides the greatest flexibility for handling and control.

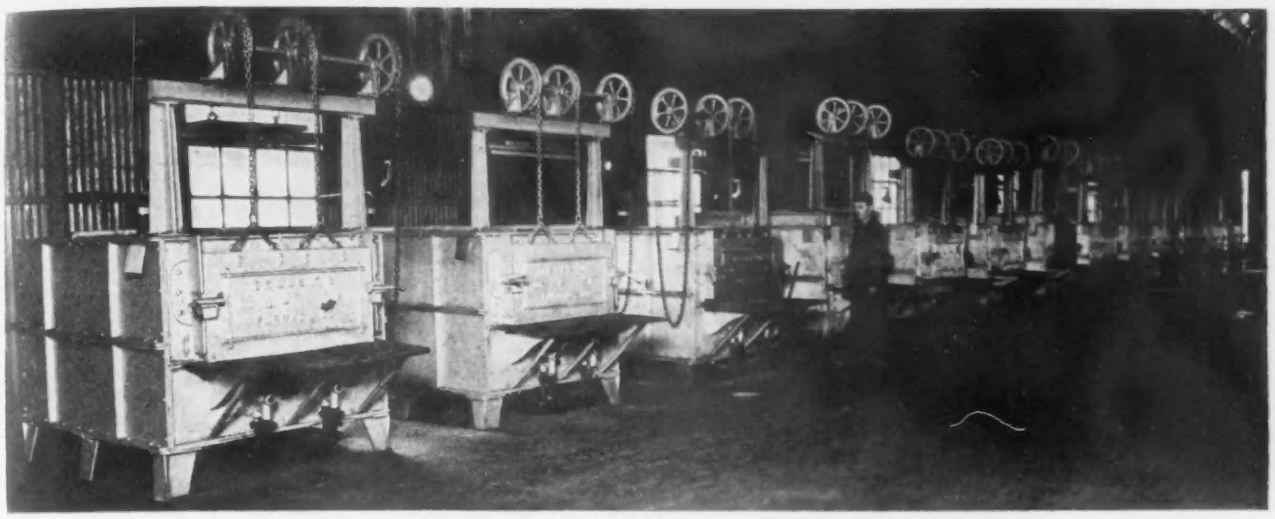
There are 13 gas furnaces of the periodic type, all alike except that 11 are semi-muffle and two are full-muffle. Of cast iron construction and lined with refractory material, each of these furnaces is 6 ft. long, 4 ft. wide and 18 in. high, inside dimensions, and stands on legs for ease in loading and unloading. Each is heated with four gas burners, two in front and two in the rear, firing below the hearth, the heat rising up around the sides. A counterweighted door is provided in front. A steel plate protrudes from the front as an elongation to the hearth for convenience in charging.

These are arranged in one row on one side of the room, and down the center are placed two steel quench tanks, sunk so that the tops are even with the floor level, and provided with covers when not in use. Auxiliary equipment includes two cylindrical steel tanks heated with two gas burners each, used for oil tempering. These are 4 ft. in diameter and 4 ft. deep.

For hardening small tools of high-speed steel there is a set-up of three units on a single stand consisting of a small preheating furnace, a cyanide furnace and a high-temperature furnace, the first and last being heated with two gas burners each and the second with one gas burner.

Gas and air are furnished to the burners through two 12-in. manifolds that run the length of the building, 160 ft., and just outside. At each furnace is a 2½-in. take-off which is reduced to 1½ in. at the burner, so as to get the volume as close to the burners as possible. Each furnace set of burners has two take-offs, one from the gas manifold and one from the air manifold. Each of these is provided with a hand valve outside the building so that they can be closed off at will. Each end of the air manifold has an escape valve by which the pressure can be equalized when only a part of the furnaces are in operation. Air is furnished to the air manifold by three individually motor-driven blowers, one of which is kept as a standby.

Everything is handled on skids, and these are placed in front of the aprons of the furnaces with the aid of a traveling crane which operates up and down the aisle in front of the furnaces. Outside of the building is located a cylindrical steel tank, 3 ft. in diameter and 10 ft. high, full of water, and containing five sets of copper pipe coils. The oil in the quench tanks is pumped continuously through these coils for cooling. Two individual motor-driven centrifugal pumps are em-



A long row of gas-fired furnaces used for various kinds of heat treating.

ployed. Each furnace has an automatic temperature control and an indicating pyrometer.

Nickel-Chrome Steel for Disk Bits

More than 200,000 different parts are produced in this plant, some of which are forgings that range in weight up to 2 tons. The principal item is a disk for rotary drilling. The bit is a heavy forging which is contracted for outside the plant and then machined to the proper dimensions and finish. The steel used is S.A.E. 3250 of the following analysis:

	Per Cent
Carbon	0.54 to 0.55
Manganese	0.30 to 0.60
Nickel	1.50 to 2.00
Chromium	0.90 to 1.25
Phosphorus ...	0.04 max.
Sulphur	0.04 max.

The heat treatment of this consists of normalizing at 1750 deg. F., cooling, reheating to 1250 to 1300 deg. F., cooling (machining), reheating to 1400 to 1450 deg. F., quenching in oil and then drawing back to the required hardness.

Nickel-Molybdenum Steel for Cutters

The cutters, which are set on small shafts in the bit end, together with the cutter shafts, etc., are forged from S. A. E. 4615 steel of the following analysis:

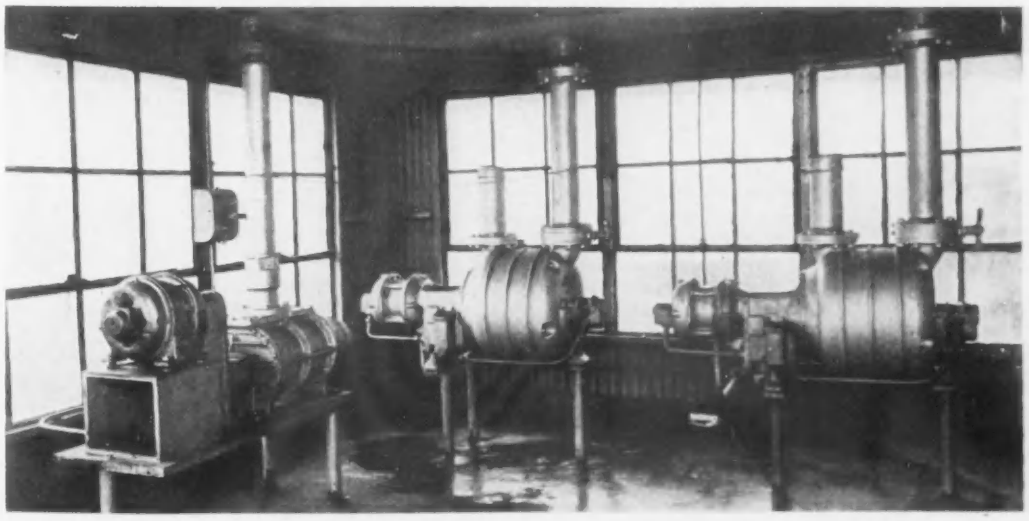
	Per Cent
Carbon	0.10 to 0.20
Manganese	0.30 to 0.60
Phosphorus ...	0.04 max.
Sulphur	0.045 max.
Nickel	1.50 to 2.00
Molybdenum ...	0.20 to 0.30

These parts are carburized, being packed first in boxes with a carburizing carbon compound. This packing is accomplished on the apron of the furnace, and the sealed boxes are then charged into the furnace with a dolly, consisting of two small wheels and two short prongs, together with a long handle. The semi-muffle type furnaces are used.

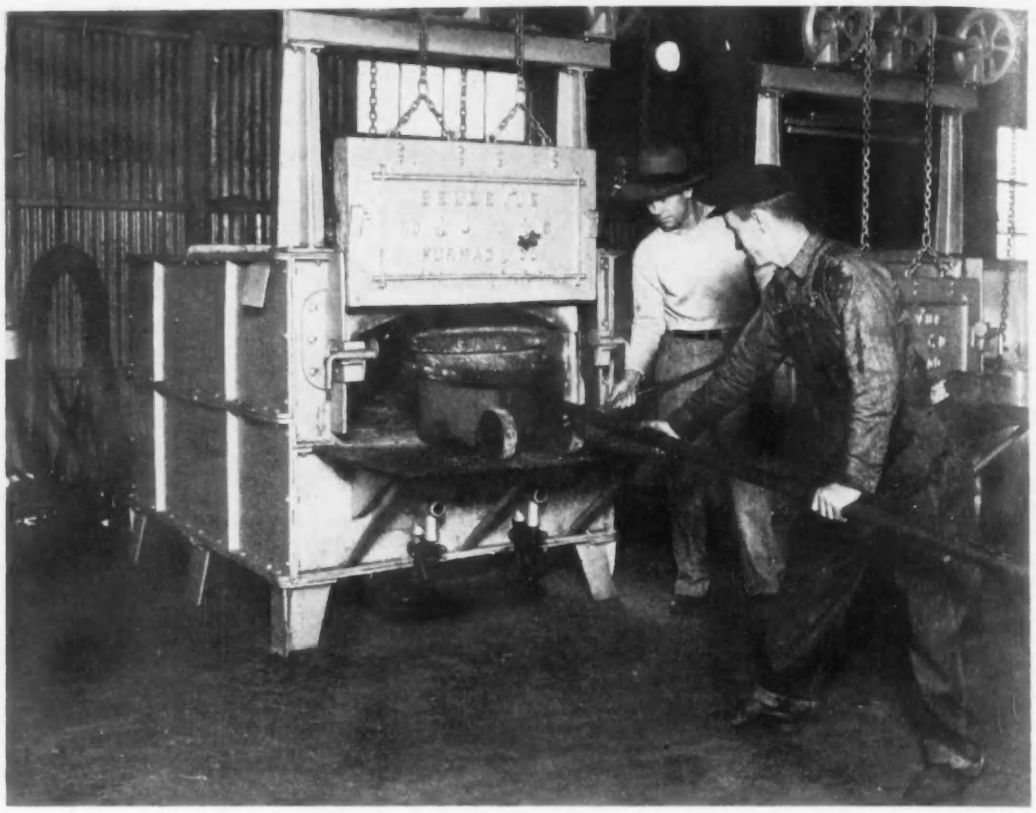
After the furnaces are charged and the doors are luted, the burners are lighted and the charge is brought up to 1650 deg. F. It requires from 14 to 20 hr. to bring the entire charge uniformly up to this temperature, after which it is allowed to soak for 24 hr. longer. The burners are then turned off and the furnace charge allowed to cool to below 300 deg. F., which requires from 12 to 24 hr., according to the nature of the charge, etc. At this point the furnaces are opened and the work dumped from the boxes, the carburizing compound going into special containers while the parts are put into skids.

The remainder of the heat treatment is accomplished in the full muffle furnaces, which are raised to 900 to 1000 deg. F. at the time the parts are charged into them. The furnaces and work are then brought up to 1525 deg. F. in about 1½ hr. and held at that temperature for an hour for each inch of cross-section to equalize the heat throughout. They are then quenched in oil and reheated to 1425 deg. F. and left to soak again for an hour an inch.

The parts are then quenched a second time in oil and put into an oil draw at 300 deg. F. and left for 5 hr., after which they are transferred to a tank of boiling water containing a cleaning compound to remove oil and relieve any small strains that may still remain. With this treatment a case depth of 0.087 in. is obtained, the grain structure of the core is changed to austentite on the first quench and that of the case becomes martensite with some sorbite with the



MOTOR-DRIVEN blowers raise the air to the proper pressure for complete combustion with the gas at the burners.



CHARGING a pot, loaded with steel parts and a carburizing compound, into a furnace with a dolly.

second quench. A Rockwell of 68 C results.

Chrome-Vanadium Steel for Reamer Cutters

The under reamer cutters are of a special analysis steel alloy as follows:

	Per Cent		Per Cent
Carbon	0.70	Chromium	1.25
Nickel	3.50	Vanadium	0.18

These are charged into a full muffle furnace at 1000 deg. F. and brought up to 1450 deg. F., at which temperature they are allowed to soak. Quenched in oil at 300 to 350 deg. F., they are charged into the other muffle furnace at 1000 deg. F., drawn for 2 hr. at that temperature and then pulled out and air cooled. This leaves them with a scleroscope of 75 to 80.

A Ni-Cr-Mo-Va Steel for Aircraft Part

The cylinder head for a Diesel aircraft engine, made at this plant, is of alloy steel of the following analysis:

	Per Cent
Nickel	3.50
Chromium	1.25
Molybdenum	0.28
Vanadium	0.18
Manganese	0.60-0.80

This is a drop forging about 12 in. long and 4½ in. in diameter. The wall thickness is 3/32 in., while the cooling fins are only 1/32 in. thick. It was necessary to devise a special method of quenching this part, for, while the bore must be very hard, at the same time the fins should be comparatively soft.

The heat treatment consists in putting the part into a muffle furnace at slightly under 1000 deg. F. and bringing it up to 1390 deg. F. and quenching in oil. One end of this part is full open and there is a valve opening in the opposite end. A bell-shaped fixture has been developed for quenching, the mouth of the head being thrust up into the mouth of the bell and clamped into place and the whole suspended above the floor. From an overhead oil reservoir approximately two barrels of oil are dropped by gravity, through the cylinder, a pump supplying the necessary pressure. It requires this amount of oil, running steadily through the cylinder, to chill the bore. While the heat is also drawn from the fins, the rate of withdrawal is so slow as to leave them practically unaffected.

Recommends Use of X-Ray in Foundry Industry

To the industrial executive the use of X-ray equipment, as an addition to present testing and research apparatus, offers the possibility of building a product the quality of which makes it superior to any heretofore achieved, said W. S. Werner, vice-president, Kelley-Koett Mfg. Co., Covington, Ky., in an address before the Detroit Foundrymen's Association on Oct. 15.

The salesman, who must rely on superior quality of his product for a successful record, is interested in the X-ray process, because it assures him and his customer a more satisfactory article, asserted Mr. Werner. Companies using X-ray for inspection have found that the number of castings rejected during machining has decreased considerably. The user of welded equipment also finds that fewer welds fail in service.

It is almost impossible to estimate the general cost of X-ray inspection, said Mr. Werner, since it varies widely with each job, depending on size, shape, weight and construction of the casting or the thickness and position of the weld, as well as general overhead and other expenses figured in shop costs. As the inspection cost will vary from 75c. to $2.50 a sq. ft., it is apparent that inexpensive castings which are not subjected to much strain, which do not have close tolerances and small machining cost, do not require this type of inspection.

Some makers of welded pressure vessels have installed X-ray equipment in portable form on the shop floor so that during or after fabrication of a vessel its welds may be tested and questionable sections replaced, said Mr. Werner. This application of X-ray has made it possible for the manufacturer to use welding instead of riveting. The crystal structure study of heat treating processes by the X-ray method has enabled rolling mills and foundries to lower annealing time and obtain more uniform output with a consequent reduction of processing costs.

RENEWED SPIRIT OF HOPEFULNESS AT STEEL INSTITUTE MEETING

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A RENEWED spirit of hopefulness permeated the autumn meeting of the American Iron and Steel Institute at the Hotel Commodore, New York, on Friday, Oct. 23.

With confidence being restored through the efforts of bankers to mobilize the credit resources of the country, leaders of the steel industry declared that the end of the deflationary process may be at hand and that the nation may "find within itself recuperative powers to generate greater enterprise in promoting trade recovery."

This quotation is from the address of James A. Farrell, president of the United States Steel Corpn. and vice-president of the institute, at the banquet Friday evening. Mr. Farrell declared also that "here and there are industries which already have experienced the quickening impulses of consumer demands."

Charles M. Schwab, president of the institute, said that fear has been lessened and that there will be no collapse. He argued for a vigorous, enterprising attitude on the part of industry to overcome the effects of the depression.

Mr. Farrell spoke only briefly at the morning meeting, reserving his principal remarks for the banquet. His address there was as follows:

"The hopes entertained at our last meeting of an early reversal of the persistent deflation of the past three years are once more revived by the action taken in banking circles to restore public confidence in the ability of the nation to find within itself recuperative powers to generate greater enterprise in promoting trade recovery. Here and there are industries which already have experienced the quickening impulses of consumer demands. There has been a slowing down of the declining trend of our export trade, and a reversal, last month, of the unfavorable balance of trade of August.

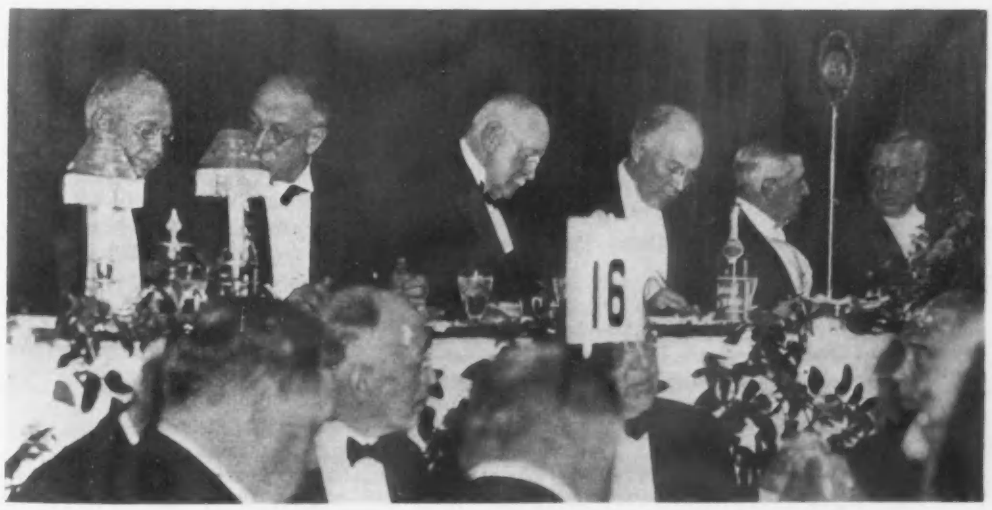
"These favorable indications, while not so pronounced as we would wish, tend to strengthen the conviction that the resources of the nation are being mobilized in an effort to shake off the despondency which has hampered enterprise, and the lack of confidence which has curtailed consumers' demands. Suffering as we are, both from underproduction and underconsumption, it is of prime importance to strengthen the confidence of our people in the future of the country and in a return to reasonable prosperity.

Beware of the Back-Seat Driver

"Much time and thought have been given by competent authorities in investigating the causes of this world-wide dislocation of trade and in estimating the value of the numerous remedies that have been put forward. In the discussion of these constructive possibilities American industry has had to bear the brunt of criticism by ill-informed theorists, some of whom seek to take advantage of the situation to undermine public confidence in the capacity and soundness of our industrial system. Dramatic events in Europe, followed by the suspension in many countries of the gold standard, have diverted attention for the moment from industry as a provocative cause. The root of the distemper is no longer sought in any defects inherent in our industrial economy, but in a combination of factors among which American industry plays but a minor role as a contributory cause.

"We have among us emotional social reformers who, with more zeal than knowledge, imagine that for every social ill there is an infallible prescription ready to hand. For a time it seemed as if some of these self-constituted physicians, at a loss to locate the mysterious source of this world-wide upset, were ready to place American industry on the dissecting table and to perform a major operation.

"Some of the schemes put forward for the reorganization of American industry would place industrial concerns in the unenviable position of the chauffeur who is harassed by back-seat drivers. If these schemes are really as sound as their authors claim, why stop short at industry? Let us imagine for a moment what would happen were any industrialist seriously to suggest the application



A FLASHLIGHT picture of a section of the speakers' table at the banquet of the American Iron and Steel Institute. From left to right are: George Gordon Crawford, president, Jones & Laughlin Steel Corpn.; Dr. F. N. Speller, of the National Tube Co., who was presented with the institute medal for the best paper presented at the May meeting; James A. Farrell, president, United States Steel Corpn.; Walker D. Hines, who spoke on the anti-trust laws; Charles M. Schwab, chairman, Bethlehem Steel Corpn., and Fritz Thyssen, German steel manufacturer.

AMERICA HAS KEYS TO THE FUTURE IN ITS OWN HANDS

By JAMES A. FARRELL

WE cannot contemplate with indifference the dangers of prolonged deflation.

When competition succeeds, not by means of lowered costs, but by means of reduced prices which are uneconomic and profitless, we force an artificial decline in commodity prices which leads to a vicious circle with lowered buying power.

We have the richest home market in the world.

We have the capital, if freed by confidence, for a more vigorous and aggressive policy to make this market the pivotal point of trade recovery.

We have an immense consuming capacity and must discover means of increasing consumer demand.

of this industrial plan to organized sport—to baseball or football, for example. We have only to contemplate the popular outcry were there any interference with the coach or captain of a team to appreciate the absurdity of schemes which, if adopted, would restrict the freedom of industrial management and sterilize initiative and enterprise. As well hand over the duties of the navigating officer of a ship to a committee of passengers as to seek to improve our industrial system by schemes which would lessen the responsibilities of industrial management under conditions which ultimately would place national industry under control of a bureaucracy.

"Gradualism" Would Lead to Communism

"The chief danger to be apprehended from these emotional outbreaks is the opening of the door to that policy of 'gradualism' which would lead us by easy stages from our present safe anchorage to that of communism. It rests upon us to resist the first steps in industrial reorganization which would substitute experiment for experience and disputed theories for well-tried principles.

"History presents not a few examples of reformers who, confounding change with progress, have bequeathed to later generations problems most difficult of solution. Emotional strain in a period of great distress led British statesmen to reverse the fiscal policy of their nation and to accept the dole. The dominant thought in that country today is how to escape from the greater social evils which the panacea of the dole has been largely instrumental in bringing about. In face of what is transpiring in England, where statesmen are coming to a full realization of dangers which expose them to the perils of socialistic bankruptcy, it would be little short of insanity to yield to the seductive appeals of social reformers who, even from within American industry itself, would set this nation on a path from which sane industrialists in England are seeking to flee. We must guard against legislative changes based upon political expediency, and which fail to take account of their permanent effects.

"The severity and extent of the present depression are due to causes over which American industry under present legislative limitations had no control. The unparalleled destruction wrought by the last war, the economic, social and political dislocations and upheavals directly due to the war, and the failure of so many countries to take a long view of their problems and to avoid temporary expedients in the solution of difficulties that called for more lasting remedies cannot be laid at the door of American industry. There are defects in every system conceived by man.

"It is far from my purpose to claim for American industry as a whole that state of perfection which we look for in vain in other departments of human activity. We have our problems and inherent defects, but these I contend would be greatly aggravated were we to yield lightly to the insinuating and plausible claims of those who profess to have discovered a royal road to human perfection and millennial happiness.

Dangers of Artificial Price Declines

"There are, however, defects in our industrial activities which it is within our power to correct. We cannot contemplate with indifference the dangers of a prolonged deflation. When competition succeeds, not by means of lowered costs, but by means of reduced prices which are uneconomic and profitless, we force an artificial decline in commodity prices which, as economists inform us, leads to a vicious circle with lowered buying power.

"America has the keys of its future very largely in its own hands. The brains, the energy and the capacity which have brought us thus far are not exhausted. We have the richest home market in the world. We have the capital, if freed by confidence, for a more vigorous and aggressive policy to make this market the pivotal point of trade recovery. We have an immense consuming capacity and must discover means for increasing consumer demand. This is a land of great vitality and vast reserves of natural resources. We cannot view with unconcern counsels of despair which would lead us backward over the heavy trail, with the standards of living of our people brought to the level of countries less fortunate and less efficient. We must resolve at all hazards to restore and maintain our standards. This calls for both vision and loyal cooperation. There is but one course before us—to pursue the path which in former periods of depression brought us in safety to higher levels of prosperity.

Competition Must Be Fair

"Competition, as we know, is a law of life. In business it means a healthy struggle for profitable trade through a lowering of costs. Legitimate competition is the chief incentive to progress through greater enterprise and efficiency. Competition in the steel industry should be maintained on these economic lines. But while we may avert the worst evils of unfair competition from abroad by means of a protective tariff, we have no such security against unfair competition among ourselves. We can rely only upon the maintenance of ethical and economical standards of business conduct. If these fail, then no protective tariffs which the highest scientific skill may devise will avail in enabling our steel industry to hold its own against world competition.

"The school of adversity has its uses, but we know by painful experience that there are limits to the adjustment of costs to prices. Let us hope for an immediate change in these conditions, let us have a live and let live policy, so that when we again meet we shall not have to say with Cassius: 'The fault, dear Brutus, is not in our stars, but in ourselves.'"

Fritz Thyssen Discusses German Situation

Other speakers at the banquet were Fritz Thyssen, German steel manufacturer; Walker D. Hines, lawyer and authority on the anti-trust laws and United States railroad administrator during a part of the period of Government control of transportation, and Strickland Gillilan, humorist.

Mr. Thyssen discussed social and economic conditions in Germany, saying that the socialistic movement in that country is taking hold of the

people like a religion. He declared that Germany's economic plight is due to the consequences of the Treaty of Versailles and to the socialistic experiments that have been conducted in that country at great cost. So long as the Treaty of Versailles exists in its present form, said Mr. Thyssen, there will be no real friendship among nations in Europe. If the treaty were revised, there would be no necessity, he added, for any nation to speak of "security."

As to the effects of Germany's present situation upon the steel industry, Mr. Thyssen said that the present annual per capita consumption of steel in Germany is 120 lb., a small amount for a great industrial nation, and only a little above the world consumption per capita of 80 lb. For a country which for a long time held second position in the world in steel production and consumption, this is a bad situation, Mr. Thyssen said.

Anti-Trust Laws Should Be Amended

Mr. Hines discussed the anti-trust laws and what could or should be done to make them conform to present-day conditions.

Suggestions for the amendment of the anti-trust laws for the purpose of promoting trade and commerce should be made, said Mr. Hines, but the method of approach needs to be considered with great care, and meanwhile it is a mistake for industry to sit back in the belief that nothing can be accomplished toward stabilization of industry under the laws as they stand. Under the guidance of competent advice, industry should do what it can now rather than wait for the laws to be changed. His contention was that the laws permit more leeway for stabilization projects than has been generally realized.

There should be legislation amending the anti-trust laws, Mr. Hines said, so that agreements to bring production into balance with demands would be legally permitted. Such production agreements could be filed with some public agency created for the purpose of supervising them, and any agreement could be suspended by this agency if thought to be against the public interest. The necessity of keeping production in balance with consumption has become much more apparent in the past decade. However, if any such agreements have been made under the present laws their legality has not been tested, because no such case has come before the United States Supreme Court.

The Supreme Court has, however, upheld the prohibition of price agreements, as in the Trenton Potteries case. What industry wants, Mr. Hines declared, is not to make agreements in restraint of trade but to promote trade. There is a feeling in industry also, it was stated, that there should be some means of getting an advance opinion as to the legality of a proposed merger. Under the present laws companies cannot get official sanction of a merger, but must carry out the proposed consolidation, and then run the risk of legal action for violating the law.

The attendance at the banquet was about 1100 persons, or only 100 fewer than attended the banquet at the spring meeting. The registration for the day sessions was higher.

"FEARS HAVE BEEN LESSENED; THERE WILL BE NO COLLAPSE"

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By CHARLES M. SCHWAB

I CAN speak much more cheerfully than would have been reasonable a month ago.

Fear has been lessened. There will be no collapse.

I believe in the continued growth of our country, the essential strength of the steel industry, and the ability of our nation to master the problems of a complicated age.

We must pause in our foolish race for building capacity.

Just as soon as our business and the business of the country begin to show an upward trend in profits, that will be the real beacon of prosperity.

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C. M. Schwab Calls for Vigorous Attitude by Industry

CHARLES M. SCHWAB, president of the American Iron and Steel Institute, in his opening address at the meeting, said that the steps which must be taken toward improvement are "a better financial structure, which is now under way; a liquidation of extravagances in business, including prices, which has already taken place in some lines to an abnormal extent; a reduction in the cost of government, which is borne by industry and the people, and a vigorous, enterprising attitude on the part of industry."

Commenting upon the large gathering, Mr. Schwab said: "In good times there is a tendency for us all to become self-sufficient nationally and individually. But times of stress bring people closer in the attempt to be helpful to one another. I believe that the close bond of interest which has held together the steel industry is due to the fact that we have gone through so many crises shoulder to shoulder."

Fear Has Been Lessened

Speaking "straight from the shoulder," as he put it, he said: "Let us recognize that we have a real depression and deal with it as such. I can speak much more cheerfully than would have been reasonable a month ago. The improving of our credit structure by virtue of the steps advocated by President Hoover and the bankers is a fundamental step in the right direction. Fear has been lessened. There will be no collapse. The sources of credit have been mobilized, and we shall pull through. I have seen us pull through too many crises to be overwhelmed by the situation of the past months.

"Whenever the unwarranted pessimism that has become so fashionable these days begins to engulf me, I think back to those dark days of 1894 and 1907, and find confidence in the thought that we came through those perilous periods to a prosperity in this country far transcending the expectations of any man of the day. I believe that history will repeat itself.

"I believe in the continued growth of our country, the essential strength

F. N. SPELLER

DR. F. N. SPELLER AWARDED STEEL INSTITUTE MEDAL

DR. F. N. SPELLER, who was awarded the American Iron and Steel Institute medal for his paper last May on "Cooperative Research in the Iron and Steel Industry," received his A.B., B.S. and D.Sc. degrees from the University of Toronto, Toronto, where he was born. Most of his life has been devoted to the steel industry. Starting as a chemist, in the open-hearth plant of the Carnegie Steel Co. at Homestead, he has gradually advanced until now he is director of the department of research of the National Tube Co., Pittsburgh. Some of his achievements include patents for improvements in rolling and finishing steel tubes and pipe, research on the cause and prevention of corrosion and patents on processes to control corrosion. He is the author of a book on "Corrosion" and of many papers before technical societies here and abroad.

of the steel industry, and the ability of our nation to master the problems of a complicated age. If this be optimism, make the most of it.

Time for Courage and Confidence

"Everyone is feeling better because of credit improvements, but for that very reason I ask you today to face facts and not to rest on our oars just because the financial world is getting its house in order. Economy and efficiency will lead us out. Extravagance and speculation in any direction will only further aggravate the situation. It is a time for courage and confidence on the part of managements greater than they have needed at any other time since the war.

"We must face some hard facts both in our own business and the industrial world as a whole. I said at our last meeting that the tide was coming in—it certainly was, but it proved to be a tidal wave. Our production this year will be about 25,000,000 tons of ingots, or 16 per cent under what was expected. This change in expectations teaches us an important lesson. As a matter of fact, America was on the upward move last spring. Our production curve had increased steadily from the first of the year. Then came the breakdown of finances in central Europe, which spread to England and brought violent repercussions to our own shores.

Change in Our World Relationships

"The lesson is that we cannot longer ignore the economy of other countries. In other depressions we could forget about hard times in other countries. Then we were a debtor nation and largely self-sufficient. Today we are a creditor nation and the prosperity of our international neighbors is necessary to our own well-being. We must promote better economic relationships among nations, and we must declare a permanent moratorium on national jingoes. We not only have a responsibility to assist our foreign neighbors toward a sound basis of recovery, but we, in this country, should pause to reflect upon the causes which have brought on their condition. The culminating blow to the finances of these countries has been the paternalistic measures, such as the dole, which have no place in our American life. We owe it to our people to see that these vicious, uneconomic practices do not gain a foothold in this country. We have abundant evidence of the ruinous effects of doles and subsidies and artificial stimulants.

"We must recognize, too, that our international neighbors were economically ill before they resorted generally to patent medicines. We have a responsibility here. We have participated in the hysteria of economic barriers which dislocated the trade of the world. It is for the National Government to decide on the proper time for any readjustment, but clearly the trade channels between all countries must be facilitated to provide ready exchange of goods while improving the standards of living.

"Back of all these difficulties, of course, is the terrific burden of the war, which destroyed wealth and man power, promoted economic fallacies, mortgaged the future, and left us the long problem of reconstruction which we must deal with today patiently and courageously.

Suggests Reduction of Armaments

"I was talking recently with a shrewd observer who has been traveling around the world. He tells me that the desire of the masses of the people in all parts of the world is for peace. The talk of another war has no place in the hearts of people anywhere. There is discussion of a naval holiday. There are moves to reduce our own Navy program. If that is what our Government deems wise, I can state that the steel industry will be the first to support the move. Some of our companies have large facilities for building Navy vessels and armament, facilities which would welcome more business; but the nation comes first, and we shall welcome any measure that fosters permanent peace.

Must Liquidate Local Government Costs

"One of the worst features of our American life has been our indifference to governmental costs. I refer particularly to our local governments, State, city and county. Here we find colossal wastes, which are a dead weight on business and the public. The Federal Government has made commendable strides in bringing down its costs in spite of the great burden of paying for past wars. But with few exceptions our local authorities have continued with their expenditures. I am informed that the burden of local governmental costs is running close to ten billions per year, as compared with seven and a half billions in 1925.

"This is more than double our Federal Government outlay of four billions annually; and it shows no recession. I affirm that our people and our industries can no longer tolerate such expenditures. Federal taxation is largely on incomes and profits, automatically adjusted when these shrink. But most of our local cost is assessed on homes, factories, farms and other property, regardless of the condition of prosperity. I know of no situation in our economic life where liquidation is more needed.

Public Works Must Be Justifiable

"I do not blame the politician alone. Business has benefited from public improvements, and these are always necessary. But we must be vigilant in seeing that only those improvements are built which are economically justifiable. We only fool ourselves by any other course. If a wasteful structure is erected we pay the bill in the long run as taxpayers. And waste is the heart of the matter. There is the waste of racketeering, the waste in countless bureaus, the extravagance in administration. It was human nature to have this extravagance when the whole country was in the same boat. But we are down to hard-pan now. Every business man and every industry is called upon to work with the local authorities in readjustment of local budgets.

"When we get into a period such as we are going through now, no exception in readjustments should be made. We are too prone to think of living costs in terms of food and clothing and shelter. We forget that the incidentals, the so-called sundries, have become an increasingly important factor in the costs of our daily lives. Unbalanced situations are the things that aggravate and prolong periods of this kind.

Cooperative Spirit of All Workers

"In our own industry I feel encouraged in spite of our difficulties. I am encouraged above all by the wonder-

ful spirit of our working force, from the common laborer to the top. They have helped us face these emergencies with an understanding loyalty and determination to carry on. In the past we have always come through to better days by practicing economy and liquidating values in line with purchasing power and demand. Labor has had to be liquidated too. But in this respect I am not referring to the working man alone. All of us from top to bottom have had to share in this liquidation.

"We all regret having to take the wage action which was general throughout the industry the early part of this month. We held to the old wage rates as long as our balance sheets would permit. But with the liquidation of prices and values in all directions it was necessary to yield to economic law.

"There are many interesting schemes to relieve unemployment today, some having meritorious features. Relief work, of course, must have the support of all. But in considering the long-range future, let us keep our feet on the ground and realize that our economic life rests on the operation of business at a reasonable profit. None of us can escape the inexorable law of the balance sheet. Today the laborer, all of us who work for a living, old people and others who are supported by dividends on their savings, all depend on profitable operations of healthy business for the means of livelihood. Accordingly, all these adjustments which industry has made to enable it to weather the storm are fundamentally a protection for all of us. Any step which fosters business in a sound economic way is an aid to our national prosperity.

Staggered Work an Achievement

"An outstanding achievement which has stood the test in a real practical way is the distribution of work to our working forces. The steel industry has generally retained its personnel, and has distributed what work was available on an equitable basis. If this policy had been adopted by industry in general early in this depression, we would have today less unemployment and less distress.

"There is another phase of the situation. Each of us owes it to his company, to his workmen, to his customers and to the general public to see that the prices of his products are stabilized at reasonable levels. Remember that there is no law of this land that advocates destructive cutthroat prices. For any of us to encourage uneconomic prices and practices is absurd, to say the least—an absolute waste of energy—just rainbow chasing—for after all is said and done, the production figures of our own institute tell us that over any period each of us has had a fair share of the going business.

Opposes Government in Business

"I do not believe it is necessary or wise to invoke further the supervision of the Government in private business. Reason dictates that we should so conduct our affairs as to afford a just return to both capital and labor. There will be temporary setbacks, of course, so long as the law of supply and demand is still operating, but in the future, as in the past, business leadership in this country will continue voluntarily to do those things which will in the end redound to the general benefit of all.

Urges Moratorium on Capacity

"We must pause in our foolish race for building capacity. The overbuilding of our industry is as nonsensical as the competition in armaments. The capacity of the steel industry, including uncompleted works, is now 68,000,000 tons of ingots annually. Our rate of production this year is 37 per cent of capacity. Even in 1929, with its output of 54,000,000 tons, we were using but 80 per cent of the present capacity and that in process of construction. It is wise to build ahead of needs. We shall require these vast facilities to the full. But this is the age of the moratorium. The world needs time to catch up, to adjust. I therefore recommend to the earnest attention of the institute a moratorium on all new building of plants until such time as the need for added capacity is clearly apparent.

"In spite of the criticisms that have been leveled at leadership today, I know of no period in our history when management has worked so hard and effectively. We need perspective. Industry has many faults and we have suffered great hardships, but the sense of responsibility which American business has displayed in these times is one of the best omens for our future.

Securities Over-Liquidated

"For a time the American public has had a bad case of nerves. The liquidation of securities has been be-

AUTHORS OF THE TECHNICAL PAPERS

T. D. YENSEN

C. D. KING

L. S. O'ROARK

R. S. McCAFFERY

W. E. STINE

"MAGNETIC Iron and Steel" was the title of the paper by Mr. Yensen, research engineer, Westinghouse Electric & Mfg. Co. Mr. King, chairman, open-hearth committee, United States Steel Corpn., New York, discussed "The Metallic Charge in Basic Open-Hearth Operations." Mr. O'Roark, the Bell Telephone Laboratories, New York, spoke on "Experiments in Speech and Music." Professor McCaffery, University of Wisconsin, Madison, Wis., read a paper on "The Bessemer Process and Its Product," while Mr. Stine's subject was "Factors That Affect the Welding Qualities of Steel."

yond all reason. One would conclude by the security prices that our transportation lines would never do any more business. Transportation, in fact, is a basic necessity of all business. Our nation has been established on the vast system of transportation, and these lines will enjoy prosperity. They are too vital a factor in our national life to be subjected to uneconomic pressure of any kind. I am not aiming to boost railroad stocks, nor am I saying that the market will go higher or lower in the immediate future, but I do say that the over-liquidated prices of many securities are a sign of too short perspective and too excitable temperament.

"As I said at the beginning, I am greatly encouraged. It has been said of the British Army that it is never ultimately defeated because it never knows when it is licked. It is that quality of stamina and stability which is characteristic of the steel industry and is bringing us through these times.

Today's Accomplishments Building Prosperity

"Our house is in order. The financial world is straightening itself out. Industry has gotten its second wind. Let us sail into the job ahead of us. Keep up the selling campaigns, keep up advertising, improve your production methods. Face the difficulties, but with courage, confidence, and knowledge that we are on the upward path. Our industry will do its part.

"Each accomplishment today is building the prosperity of tomorrow. As the losses grow less, as progress is made inch by inch, we are progressing steadily to better times. Let us keep to our business. Let us forget predictions and panaceas. Let us manage as efficiently and economically as we know how. Remember this: Just as soon as our business and the business of the country begin to show an upward trend in profits, that will be the real beacon of prosperity. It was so a century ago, it is so today."

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Government Competition to Be Investigated

WASHINGTON, Oct. 27.—Allen Hollis, chairman of the board and president, United Life & Accident Insurance Co., Concord, N. H., heads a special committee of business men and economists named last week by the Chamber of Commerce of the United States to make a survey of the forms and extent of Government competition with private business. Among other members of the committee are Homer L. Ferguson, president, Newport News Shipbuilding & Dry Dock Co., Newport News, Va., and Thomas J. Watson, president, International Business Machine Corpn., New York.

Steel Founders See Some Signs of Improvement in Business

MILDLY optimistic reports of conditions existing in the steel foundry industry were heard at the October meeting of the Steel Founders Society of America at the Hotel Roosevelt, New York, Oct. 22. An increase in the number of foundries in the United States and Canada reporting operations and bookings above 50 per cent of capacity was reported. As a whole, however, present operations in per cent of capacity are lower than in September, with a large drop from last year.

An increase of 2.5 per cent in foundries having operations more than 50 per cent of capacity and a gain of 2.2 per cent reporting new orders of more than 50 per cent was recorded by an analysis of the business reports of the member companies. Reports from 65 foundries showed operations in September at 20.6 per cent and bookings at 18.7 per cent of capacity. This contrasts with August figures of operations at 23.5 per cent and bookings at 22 per cent for 70 foundries, with data for a year ago at 49.2 per cent for operations and 38.4 per cent bookings. Sentiment as to the outlook was slightly improved over that of a month ago.

Urges Reduction in Expenses

In the brief address, the chairman for the day, G. R. Casey, Treadwell Engineering Co., Easton, Pa., and vice-president of society's Eastern division, said he detected a soundly optimistic note in the current statements of competent conservative analysts. He urged a careful examination and reduction of expenses in manufacturing and condemned selling below cost of production so as to keep operations up to normal during the depression.

"The most damnable thing about this depression is that so many men are fed up with their own business," said Col. W. T. Chevalier, McGraw-Hill Publishing Co., New York, in an address at the luncheon. He made a plea for as much science in selling a product as in making it and emphasized the statement that, if production men would regard selling as a manufacturing process, there would be a revolution in industries now dominated by production-thinking.

Capitalistic Theories Impugned

"The present depression, with its widespread misery, has disclosed defects so vast as to impugn the claims of our capitalist theories," said W. W. Nichols of the Allis-Chalmers Mfg. Co., Milwaukee. "It behooves us now more than ever to change. Even communism may have some features, hidden from our prejudiced grasp, worthy of emulation." Mr. Nichols' subject was "Cooperation — Its Use and Abuse." He pleaded for cooperation in the provision of daily information on market transactions and said that the sooner business abandoned uncertain guessing and arbitrary and unreasoning executive action the better it would be for American industry. "The day of the hard-boiled, would-be autocrat in business is passing," he added.

Change in Specifications Discussed

An important topic discussed by the members was a suggested change in the present class B specifications for carbon steel castings. One of the large railroads has framed a modification of these specifications so that the elastic limit is raised from 36,000 to 38,000 lb. per sq. in., with an increase of 20 per cent in the elongation or from 20 to 24 per cent in 2 in., and an increase in reduction of area of 33⅓ per cent, or from 30 to 40 per cent. The dangers in an agreement to accept this change were debated, with the suggestion that such alterations should come through the regular channels of the technical societies and their committees. A committee was authorized to investigate proper procedure to meet this problem.

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New Metal Spraying Process Developed

A new method of spraying metal, called "Mellozing," has been developed in Sheffield, England. The pistol used for spraying is of the gravity feed type, and a container, embodied in it, holds in a molten condition the metal to be sprayed. This metal flows out of the pistol and through a nozzle, where it is met by a blast of heated compressed air, which vaporizes the metal and brings it with considerable force against the surface of the material which is being coated.

All metallic material has to be thoroughly sand-blasted before being sprayed, in order to insure that the surface is absolutely clean and also to provide an open base for the sprayed particles. Among the advantages claimed for this method over ordinary galvanizing methods is that there is no limitation to the size of the article which can be treated. The speed of the spraying is determined by the article to be sprayed but it is possible to spray approximately 8 sq. ft. per min. with a coating of approximately 0.004 in.

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Contracts let by 33 State highways in September totaled 2604 miles of roads at $29,870,872, according to a report made by W. C. Markham, executive secretary of the American Association of State Highway Officials.

INCREASED SPEED AND ACCURACY FEATURE NEW SQUARING SHEAR

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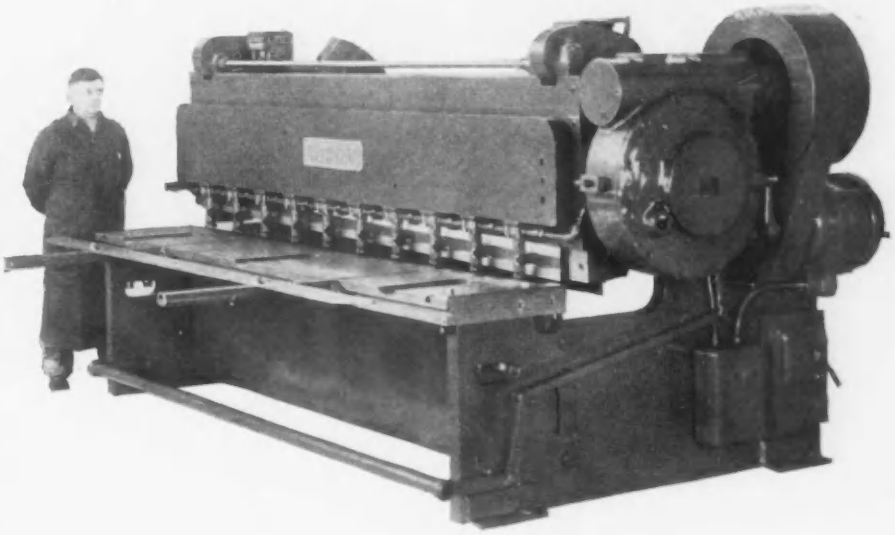


OF new design and built to machine tool standards, the all-steel squaring and slitting shear illustrated is offered by the Cincinnati Shaper Co., Cincinnati, as providing marked increase in both speed and accuracy of operation.

As to speed, the 3/16-in. by 10 and 12-ft. shears operate at 60 strokes a minute, and the ½-in. by 10 and 12-ft. machines at 40 strokes a minute.

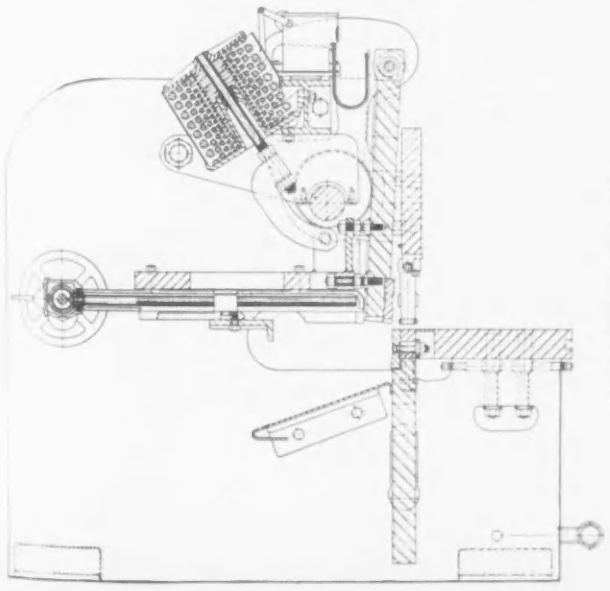
The shears are designed to cut straight and parallel and to trim sheets accurately without requiring the squaring arm to be set out of square or the back gage out of parallel in order to compensate for side movement of the sheets. The accuracy is attributed to several features, the most important of which are the hydraulic hold-downs, the low rack and the rigidity obtained by the all-steel construction.

The hydraulic hold-downs provide high clamping pressure to prevent sheet slippage and the pressure is uniform regardless of variations in the thickness of the sheets. Furthermore, a low rack or shear angle—5/16 in. per foot on the 3/8-in. by 12-ft. shear—is provided to reduce distortion in the work.

All main members including housings, upper and lower knife bars, bed, pitman links and back brace, are made of rolled steel plate and have the necessary strength and rigidity for accuracy and long knife life. The position of the drive shaft, which extends behind the upper knife bar instead of above it, makes for a low and compact design.

Vertical adjustment of the upper knife bar is controlled at one point. When this adjustment is in the "up" position, the knives do not pass at the open end and the shear can be used for slitting. For squaring or notching, the adjustment is placed in the "down" position, causing the knives to come together for their entire length. Adjustment being made at a single point, difficulty in maintaining horizontal alinement of the upper knife bar is avoided.

Drive to the main shaft is through a silent worm gear reduction unit from the flywheel which is V-belted to the driving motor. The worm-wheel has a rim of high tensile strength bronze mounted on a steel disk in which are cut five clutch jaws. These jaws are hardened; they mesh with a clutch member that slides on a splined sleeve keyed to the tapered end of the drive shaft. The clutch, which runs in a bath of oil, is operated by a heavy spring and a clutch pin actuated by means of the foot treadle.



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SPRING counterbalances and steel pitman links exert backward as well as vertical components that hold the upper knife bar bearings against the guides. The in-and-out adjustment on the table to obtain proper knife clearance is also shown in the cross-section view at left.

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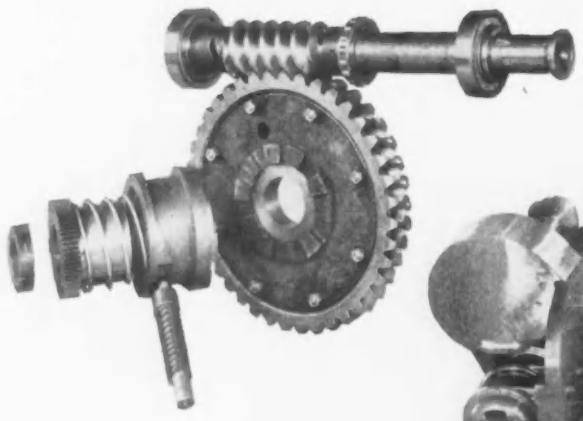
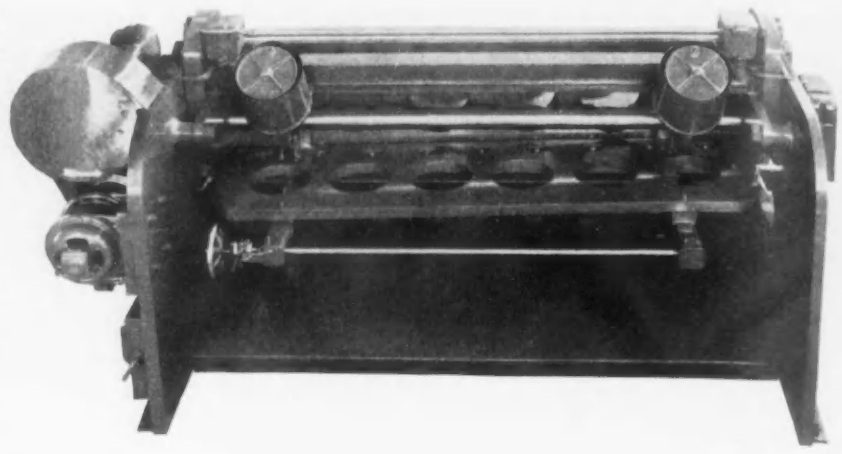
Knife Bar Held Against Guides

The upper knife bar is operated from the eccentric shaft through steel pitman links that exert a pull downward and slightly backward, the latter component tending to hold the knife bar against its hardened and ground bearings regardless of any wear that may occur in the slides. In like manner, the line of action of the spring counterbalances is tilted slightly to the rear to hold the knife bar against its guides. Even with all gibs removed from the guide bearings, the shears are said to cut smoothly and accurately up to their full rated capacity. In addition to providing smooth action, the multiple low-tension spring counterbalances hold the knife bar at top stroke when the clutch is disengaged, thus performing the function of a brake.

Backward thrust of the knife bar is taken by bronze lined slides which bear upon hardened and ground guide bearings mounted in the housings.



REAR view (below) shows adjustable back brace and back gage dial reading to 1/64 in. View at left shows worm-wheel drive and clutch assembly.



The upper knife bar itself is a deep steel plate having a deep horizontal steel back brace that keeps the knives from springing apart due to side thrust during the cut. Adjustment is provided at 12-in. intervals between the back brace and knife bar so that exact alinement can easily be maintained.

Resting directly on the solid housing plates, the bed is adjustable forward or backward to provide proper clearance. Access to the lower knife bolts is provided by recesses in the bed, normally closed with plate steel covers machined flush. The lower knife can be changed in the standing position. Finger slots, machined with a radius at the closed end as well as at each side, facilitate grasping the sheets, and the wall at the closed end of the shear is machined with a bevel or taper to safeguard the operator's hands.

Damage to the shear through overloading is prevented by safety friction disks that permit the flywheel rim to slip on its mounting in case of excessive power demands. Anti-friction bearings are used for worm and flywheel shaft; bronze bearings for the drive shaft and eccentrics. Automatic sight feed lubrication is provided for all bearings.

The shears are made in standard sizes to handle 10-gage, 3/16-in., 1/4-in., 3/8-in., and 1/2-in. material. In addition to the standard lengths of 6, 8, 10 and 12 ft., shears 12 and 14 ft. long can be furnished. The ratings are for continuous or mill duty at maximum rated capacity. Standard equipment on all models includes one-piece four-edged knives and front, side, and universal ball-bearing back gages.

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Standardized Markings for Oxweld Rods

A STANDARDIZED marking system adopted by the Linde Air Products Co., 30 East Forty-second Street, New York, involves stamping the name "Oxweld" as well as the type and number on all welding rods of that brand with the exception of rods smaller than ⅛ in. diameter and the three types of aluminum welding rod which are identified by similar markings placed on the packing box.

High test patented steel rod, marked "Oxweld No. 1 H. T. Patented," is for uniform high strength welds in steel plate, sheets, structural shapes, pipe, steel castings, etc. High carbon steel rod, marked "Oxweld No. 2 Steel," is for use when welding high carbon steel. For cold-rolled shafting, or nickel or chrome steel, nickel-steel rod marked "Oxweld No. 3 Steel," is offered. For manganese steel welding there is No. 4 manganese steel rod, the ends of each rod being painted green for identification. Copper-coated drawn iron rods, for welding steel plate, sheet, structural shapes, pipe, etc., are marked "Oxweld No. 7." No. 9 cast iron alloy rods, which are for use when welding gray iron castings, are marked "Oxweld C. I."

There are nine different non-ferrous welding rods. For high strength welds in copper, brass or bronze, or for bronze-welding malleable iron, steel or cast iron, there are the non-fuming high strength rods, marked "Oxweld No. 21 H. S. Bronze Patented."

For bronze-welding cast iron and for welding brass, bronze, etc., there are "Oxweld No. 10 Bronze"; and the No. 11 drawn manganese bronze rod, stamped "Oxweld Manganese Bronze." No. 13 drawn brass rods, used on sheet or cast brass, are all stamped "Oxweld Brass." For rail bonding and metal furniture manufacture there is the No. 19 rod, which is marked "Oxweld Cupro."

There are three different types of Oxweld aluminum welding rods: No. 14 drawn aluminum rod for sheet work; No. 15 lynite aluminum rod, for aluminum castings; and No. 23 aluminum rod for cast and sheet aluminum and aluminum alloys.

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Pressure Relief Valve Has Wide Range

A PRESSURE relief valve, placed on the market by the Brown & Sharpe Mfg. Co., Providence, R. I., for use on hydraulically-operated machinery, is especially adapted for operation in connection with the company's Nos. 53 and 55 rotary geared pumps. By removing the hexagon cap and turning an adjusting screw, the valve springs can be set to permit operation at any desired pressure up to 200 lb. per sq. in. Guides are provided to prevent fluttering and noisy action. Once set for a predetermined pressure, no further attention is said to be required. By-passed liquid escapes readily through the large valve chamber and the double spring arrangement is designed to give a wide range and flexibility. The valve is threaded to take 1-in. pipe.

A LARGE valve chamber provides a free exit for by-passed liquid.

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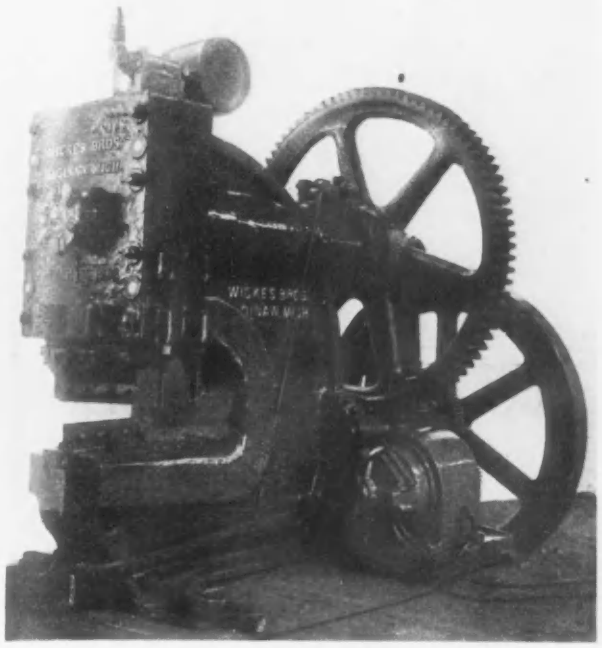


STEEL rounds 4½-in. diameter and 1½ x 16-in. flats can be sheared; the heavy cast-steel frame of the machine is a feature.

New Heavy-Duty Punch and Shear

DRIVEN by a 25-hp. punch-press type motor, the No. 12 heavy-duty vertical punch and shear, recently brought out by Wickes Brothers, Saginaw, Mich., has a capacity of 500 tons applied pressure, and is designed to shear 4½-in. round steel bars, 16 x 1½-in. flats, and structural shapes of equivalent area. The main punch body is a steel casting providing a 24-in. depth of throat. The ram stroke is 5 in. An adjustable counterweight permits balancing of the ram with various types of punching and shearing tools.

All gears are of steel and have teeth cut from the solid; the motor pinion is made of rawhide with bronze shrouding. Bronze bearings are used throughout and the bearing surfaces for the steel ram in the punch body are of bronze.

The cam ring of the clutch is cast integral with the body of the sliding clutch member; by varying the position of the pull-out roller lengthwise on the shaft, the ram and shearing tools can be caused to stop at any desired point of the stroke. A foot treadle is used to operate the clutch, or the press can be equipped with push button for electric control of the clutch by means of a solenoid. Net weight of the machine, without driving motor, is 54,800 lb.

Portable Grinders with Swivel Mounting

PORTABLE electric grinders made by the Binghamton Flexible Shaft Co., Johnson City, N. Y., have been redesigned; motor units of single and three-speed machines are equipped with a tilting and swiveling mounting that enables the source of driving power to conform to every angle of the flexible shaft, thus reducing the amount of bending and prolonging its life.

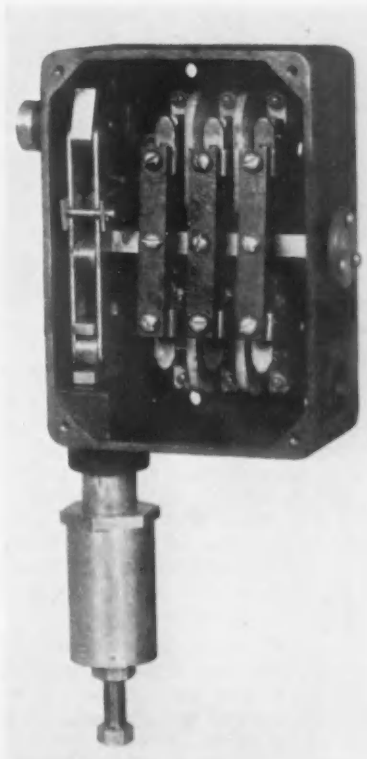
Units equipped with four-speed drive have been fitted with grooved pulleys and V-belts. Hand piece and countershaft are ball bearing mounted and a totally inclosed ball-bearing type motor is employed. The company's flexible shaft core is used in connection with a heavy rubber case.

Surface Combustion Corpn., Toledo, Ohio, is completing the installation of a new type gas carburizing furnace in the Newcastle, Ind., plant of the Chrysler Corpn. The Combustion corporation also installed a continuous gas-fired conveyor furnace for the hardening of small miscellaneous steel parts in the Campello, Mass., plant of the Campello Shank Co.

Snap-Action Limit Switch Can Be Foot Operated

A NEW plunger type, snap action, weather-proof limit switch, bearing the type designation CR-9441-LS443D and designed for general industrial and steel mill application, has been announced by the General Electric Co., Schenectady, N. Y. It is particularly adapted for foot-operation and may be mounted in any position.

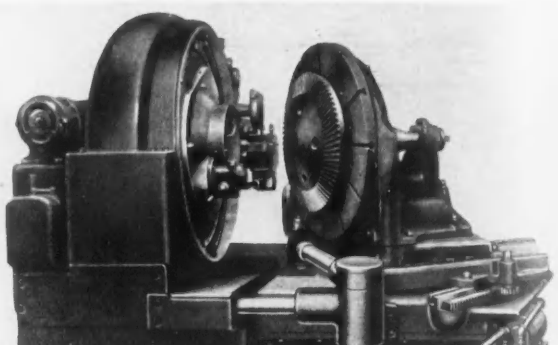
The switch has six separate electrical circuits, three normally open and three normally closed. Each contact arm in the switch may be removed by taking out a screw for easy access to the terminal studs for connecting the control lines.



A cam and ball mechanism provides positive snap action, in either direction. The plunger is fitted with two main springs. The returning spring resets the switch in normal position when pressure is removed from the plunger while the overtravel spring compensates for any overtravel in excess of the half inch required to operate the switch. A round head set screw and lock nut is supplied as part of the overtravel member for adjusting the switch when installing it.

The switch is of rugged construction and is particularly adapted for rough-duty installations. The inclosing case is of weather-proof cast iron construction with an opening in the side for 1-in. conduit connection. All bearings are made of oil-less bearing material and consequently no lubrication is needed after installation.

40 In. Spiral Bevel and Hypoid Gear Generator



THE machine employs a single tool and is universal within its range.

THE Gleason Works, Rochester, N. Y., has announced a new spiral bevel and hypoid gear generator, designated as No. 40 and intended to fill the need for a machine having a capacity range between that of the company's 25-in. generators and its larger 60 and 90-in. units.

A single tool is employed and the tooth profile is obtained with a generating action similar to that of previous models. Accurate tooth spacing and uniform tooth shape are obtained, it is pointed out, as a result of the continuous rotation of the blank and the tooth-to-tooth action of the tool. After the machine is started, operation continues without interruption until the cut is finished, when the machine is stopped automatically.

The machine is equipped with a double-end workhead. A large faceplate is mounted on one end, the other end being used when cutting pinions. Either end can be swung easily into working position and a positive lock holds the head during cutting. All feeding is done by this head, which can be set to the proper angle to feed the work directly into the tool. When cutting hypoids, the gear of the pair is cut on the standard workhead. A special workhead with an additional vertical adjustment is used in cutting the pinion in the offset position in which it is required to run. This head, which is supplied as special equipment, is bolted to the sliding base of the machine in place of the standard workhead.

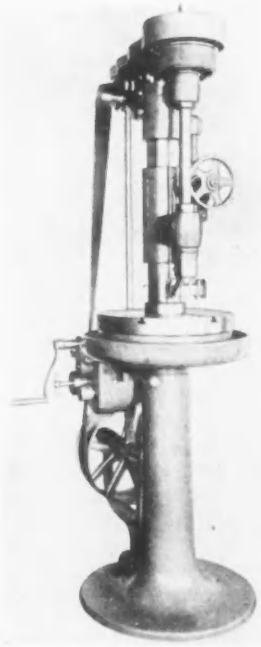
The cradle on which the toolslide and crank are carried is a complete circle and can be adjusted to and rotated through any required angle. The slide can be offset from the center of the cradle to cut any spiral angle from 0 to 30 deg. The tool is carried in a positively operated clapper box which lifts the tool clear of the work on the return stroke. Length of stroke is adjustable for face widths up to 7 in.

Index change gears provide for setting the machine to cut the desired number of teeth. As all gear trains in the machine run continuously, backlash has no effect on the accuracy of the work. Adjustment of tool speed and rate of feed is made by means of change gears. Twelve speeds, from 11 to 70 strokes a min., are obtainable; the rate of feed is adjustable throughout the range of the machine.

The machine can be arranged only for a coupled drive with a 7½-hp. 1800 or 1500-r.p.m. motor. Specifications include: longest cone distance capacity (25-deg. spiral angle), 20 in.; (15-deg. spiral angle), 24 in.; largest pitch angle (shafts at 90 deg.), 84 deg. 18 min.; smallest pitch angle (shafts at 90 deg), 5 deg. 42 min.; extreme ratio (shafts at 90 deg), 10:1; largest pitch diameter, 10:1 ratio (25-deg. spiral angle), 40 in.; and minimum number of teeth in miter gears, 16. Floor space of approximately 90 x 120 in. is occupied; the machine weighs 36,000 lb.

New Vertical Miller with Rotating Table

A CONTINUOUS vertical milling machine, designed to mill small parts that might otherwise be machined in a planer, has been placed on the market by the E. W. Bemis Machine Co., Worcester, Mass. Work is loaded in suitable holders on the circular rotating table and as fast as one piece has passed under the cutter it is replaced by the operator, thus permitting continuous operation.



The work table, which is 17½ in. in diameter, revolves about the post on ½-in. balls, the drive being through a worm and worm gear. A gear box provides four table speeds. Two cutting speeds are available for the 5-in. milling cutter which is carried by a large spindle running in a tapered bronze bearing. If desired, hand feed may be used for a single piece. Maximum distance from cutter to table is 5⅞ in. The machine illustrated is equipped for belt drive, but motor drive with ball and Timken bearings can be furnished. Overall height of the miller is 6 ft.

Soft Flame Welding Torch

UNUSUALLY soft flame characteristics are claimed for a new welding torch placed on the market by the Air Reduction Sales Co., Lincoln Building, New York. The usual method of conducting the gases to the tip is reversed, the oxygen entering the torch head at the side and the acetylene through the center. The mixing device operates on the same principle employed in Airco-Davis-Bournonville torches and is designed to assure intimate mixing of the gases before they enter the tip.

Other features of this torch, the No. 9800, include easily repacked ball-seat type needle valves, and a ribbed handle grip. A skirt has been added to the usual hexagon mixing head nut, permitting it to be tightened or removed by hand, without the use of a wrench. Tips are of pure hard-drawn copper, of both swaged and separable types and formed to produce either a bulbous or long-pointed flame. An attachment can be furnished to convert the tool into an efficient cutting torch suitable for the range of work usually required by the welder.

Inclined Spindle Borer for Multi-Cylinder Blocks

FOR boring, counterboring and reaming two rows of inclined cylinder bores in 8, 12 and 16-cylinder engines at the American LaFrance & Foamite Corpn. plant, Elmira, N. Y., the multiple-spindle machine here illustrated was built by the Moline Tool Co., Moline, Ill. A turntable with conveyor rollers is provided to handle the heavy blocks which, in the 12-cylinder size, weigh 568 lb. This table permits work to be turned easily before reloading in the jig to bore the second row of cylinder holes, and in connection with the special jig makes for a minimum of handling.

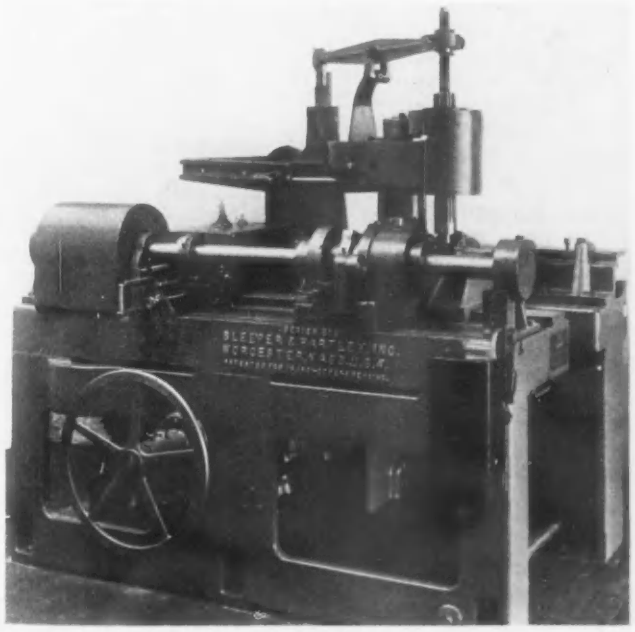
Cylinders are rough and finished-bored and reamed to 4.250-in. diameter, then counterbored to 4.260 in. Every other hole in a row is machined at one setting; the alternate cylinder holes are bored after indexing. Piloting of the boring bar, either above or below the work, is said to be unnecessary because of the massive construction of the heads which carry the boring spindles. The entire stroke or travel of the rail is 24 in.

Pick-off gears permit three changes of spindle speeds, giving 60 ft. per min. for roughing and semi-finishing, 25 ft. per min. for counterboring, and a third speed of 45 ft. per min. as an intermediate. Close adjustment of feed is made possible by the Oilgear hydraulic feeding system. Power for driving the spindles as well as the Oilgear unit is provided by a 30-hp., 1800-r.p.m. motor through silent chain drive. Overall height of the machine is 10 ft.; it weighs approximately 30,000 lb.

MOTOR blocks weighing more than 500 lb. are held in a special jig. After one row of cylinders is machined the work is reversed on the turntable at the right of the machine and returned to the jig for boring the opposite row of cylinders.

Machine Winds 50-Coil Torsion Springs at High Speed

HIGH-SPEED automatic production of heavy wire torsion springs has been obtained with the machine here illustrated. This spring winder, designated as No. 2½, was built by Sleeper & Hartley, Inc., Worcester, Mass., for shipment to the Autostroy Doskino plant in Soviet Russia. It coils wire ranging from No. 14 (0.0800 in.) to ¼ in. In the smaller wire sizes it will produce springs having up to 50 coils at a rate of 20 springs a minute; 25-coil springs of heavier wire can be wound at 10 a minute. Regardless of wire size, projecting ends up to 7 and 12 in. long can be left on either or both ends of the spring body; in some cases these ends can be formed automatically as they come from the machine. Coils up to 4-in. outside diameter can be wound.



ADJUSTMENTS permit variation of the number of coils, diameter and length of springs, and form of projecting ends.

Nine major adjusting points assure a careful and accurate control of spring dimensions. All rotating parts are mounted in ball or roller bearings to provide ease of operation. The driving motor is mounted between the heavy frames, out of the way of dirt. The machine occupies only 4½ x 6 ft. of floor space. It is adapted for use in automotive, agricultural implement, tractor and other plants.

Marks Perry Steel Corpn., 300 South Artillery Avenue, Detroit, has been organized as a distributer of sheet and strip steel. Leo H. Marks is president, Mort I. Marks is vice-president, and Dare E. Perry is secretary-treasurer.

Effects of Freight Rate Rise on Steel Industry Studied

Little or No Stimulation of Buying Looked For—Existing Rate Relationships Will Be Maintained

WASHINGTON, Oct. 27.—From a point of its effect on competition in the iron and steel industry, the highlight in the decision of the Interstate Commerce Commission in the so-called 15 per cent rate advance case apparently centers on the provision exempting less-than-carload shipments of less than 175 miles from increased rates and making an increase of 1c. per 100 lb. on such shipments of 175 miles to 250 miles. Undoubtedly, the commission made this provision in order to permit the rail carriers to meet motor truck and water competition.

But it also is seen as setting up a spread between existing rate relationships of steel districts. This is held to be particularly true of the Pittsburgh-Valleys districts. It is pointed out that this provision will work to their disadvantage in favor of Eastern mills. The explanation is made that the Pittsburgh-Valleys districts are almost invariably 250 miles or more from the Eastern seaboard territory.

These districts therefore, if they reach Atlantic seaboard markets, will be compelled to pay the full 2c. per 100 lb. suggested by the commission on iron and steel, though in no case shall the increase exceed 10 per cent of the present rates. On the other hand, Eastern mills on the Atlantic seaboard or within 175 miles of it will not have to pay an increase in rates on less-than-carload shipments. Those within 175 to 250 miles will have to pay but 1c. per 100 lb. additional. It has been further pointed out the Pittsburgh-Valleys mills are in many cases more than 250 miles from some of the interior territory backing up to these districts and in these instances they will likewise be at a disadvantage.

Increase on Raw Materials Was Opposed at Hearings

The proposal to place an additional (maximum) charge of $3 per car on coal, coke and iron ore and $6 per car on pig iron and scrap also runs counter to protests made at the hearings by the iron and steel interests of the Pittsburgh and Youngstown districts. Except for the Newport Rolling Mill Co., the Youngstown and Pittsburgh districts, the latter through the Jones & Laughlin Steel Corpn., were the only large steel sections that opposed increased rates. The Jones & Laughlin representation was based largely on the contention that an increased rate on iron ore would be to the further advantage of Lake plants, though the protest also made general objection to higher rates. The Youngstown protest was aimed particularly against increased rates in inbound raw materials, but it also protested increased rates on outbound finished material as well. The Youngstown steel interests, through the Chamber of Commerce of that city, made the point that both its inbound and outbound shipments move by rail, while Lake mills receive ore by water and Pittsburgh district mills receive coal by water. Higher rates on raw materials were held to be particularly objectionable because about five or six tons are required to make one ton of steel. The commission does not list limestone, a blast furnace flux, in products which are proposed to be either exempt or to take increased rates, though it is held that a liberal construction of its findings would indicate it proposes a maximum increase on this product of $3 per car along with coal, coke and ore. The increase on coke, of course, will mean little to the vast bulk of steel makers since they manufacture their own coke. It will affect mostly merchant furnace and foundry interests.

It is held to be a question as to what the effect may be of the proposed 2c. per 100 lb. additional charge on long hauls of iron and steel. Whether the advance will mean greater diversion of iron and steel shipments from rail to other forms of transportation can be known only after the test has been made.

Conditioned upon the railroads placing in a common pool revenue arising from increased rates, the commission proposed to permit application of the higher rates upon short notice. The railroads are required to submit the pooling plan on or before Dec. 1 for approval by the commission. The proposed increases would be permitted to continue in effect until March 31, 1933. Their continuance after that time, the commission said, will depend upon conditions then existing.

Ore Rate Question Raised

The suggested increase of $3 per car on iron ore has disturbed interior plants which receive shipments by the Lakes from the Lake Superior region. These shipments represent three distinct movements. The ore is moved by rail from the mines to the upper docks, then transshipped by boat to lower Lake docks and from the latter moved by rail to interior consuming points, such as the Pittsburgh and Valleys districts. The commission has no jurisdiction over the Lake movement. Consequently the ore is not shipped on through movements and the commission's control extends over two rail hauls. It was said that the $3 charge would apply to each rail movement, making an increase of $6 per car, which would handicap interior plants $3 a car over the charge that would be assessed to Lake front plants. It is claimed the maximum increase of 10 per cent would apply to each movement and not to the total charge.

The commission's provision says:

"In no event shall the increase levied on any carload be in excess of 10 per cent," etc.

The same situation would apply to Lake cargo coal going in a direction reverse from that of the ore.

Situation May Be Adjusted

Nevertheless, it is understood that the situation is one of many which the commission holds itself ready to adjust. The belief prevails that the commission did not take these particular movements into consideration and really meant that the added charge of $3 a car should be the maximum in the case of ore and coal and $6 per car in the case of scrap.

The commission stated specifically that its plan "is designed to avoid imposing burdens on industry which cannot reasonably be borne under present conditions . . . and to disturb business conditions as little as possible by preserving, very generally, existing rate relationships."

It was also said:

"If tariffs are filed, in accordance with this suggestion, proposing changes in rates upon particular movements or kinds of traffic, we shall be guided, in determining whether they shall be suspended, not only by statements filed in support and protest, but also, in part, by our own general knowledge . . . as bearing on the particular kind of traffic in question."

This provision is held to open the door to clarification of the situation as it relates to charges on ore, coal, etc., and it is apparently felt that the commission would accede to protests that the charges should be limited to the stated amounts per car for the complete movements from mines to consuming points. Railroads themselves, it is contended, probably would agree to the suggestion as a means of protecting alike all the consumers they serve rather than to discriminate among them.

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Some Dissatisfaction with Freight Rate Decision

PITTSBURGH, Oct. 27.—Steel company traffic executives in this district are not entirely satisfied with the recommendations of the Interstate Commerce Commission for the raising of freight rates on iron and steel products and their ingredients. Some of them feel that the advances granted are not sufficient to bring much relief to the railroads, and at the same

time are likely to react unfavorably to the steel companies because of changed relationships.

With the higher rates not likely to become effective until some time during December, it is rather difficult to figure out just how much the freight bills of the local steel companies will be raised. With the present low rate of operations, the increase probably will not be large, and the fact that the movement of ore from Lake Erie ports to Pittsburgh district consuming plants will have largely been completed for this season will further postpone the full effects of the changes.

It is also pointed out that the application of advances on ore and scrap to be applied to the car rather than to the ton will lead to the heavier loading of cars whenever possible. This will not be true in the case of finished steel products, the rate on which is to be based on the ton. The $6 a car maximum advance on iron and steel scrap will be absorbed by dealers to some extent, but will eventually be passed on to the steel companies in the form of stronger scrap quotations, and little effect will be noticeable at any definite time.

The Pittsburgh district is more fortunate than other steel consuming centers in that the higher rates on coal and coke can be avoided by the continuance of water shipments. Little coal for coking purposes reaches local steel plants by rail, and no change is contemplated on the rates for water shipment.

Sales executives do not believe that the slight increase in freight rates on finished iron and steel products will bring about much of a gain in releases in order to take advantage of the old rates. It is pointed out that actual price advances on such products as sheets and strip steel developed little additional tonnage during the summer, and most consumers are still content to take their chance on getting a satisfactory price when their purchases can no longer be delayed. At the same time many companies, particularly in Ohio where inventory taxes are high, do not wish to carry any additional stock at this time.

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Ore Costs Not Affected Before 1932 Season

CLEVELAND, Oct. 27.—Production costs for steel companies will be increased somewhat by the proposed freight rate advances and these probably will be absorbed by the producer except the increase in the cost of shipping the steel or pig iron from the producers' to the consumers' plants.

With large stocks of ore in their yards and the Lake shipping season over before the advances would become effective, the increased cost of handling ore would scarcely be felt before the opening of navigation.

The freight advance doubtless will result in a demand from shippers for cars of the largest capacity for shipping ore, coal, pig iron and scrap. As coke is usually shipped in maximum car loads of about 30 tons there is little, if any, chance to save on increasing the amount of coke carried in a car.

Should present water rates on pig iron and steel shipped on the Great Lakes remain unchanged, the higher rail rates would make it more difficult for producers shipping by rail to compete in the Michigan territory with steel and pig iron that is shipped in by water. However, it is believed that should the proposed advance in rail rates become effective, Lake vessel interests will boost up their rates sufficiently to maintain the present differential. Motor trucking companies probably would also mark up their rates.

The consensus of opinion seems to be that the rate advance will cause very few consumers to stock up to any extent before the higher rates are put in effect. Shippers must pay their freight bills in cash and the little advantage that they would gain in taking shipments before the higher rates apply would not be much of an incentive.

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Freight Rate Decision on Cotton Ties in South

WASHINGTON, Oct. 27.—A proposed report last week by Examiner Harris Fleming of the Interstate Commerce Commission affirms a previous holding justifying rates proposed in the South on cotton bale covering and iron and steel ties and buckles in less than carloads. The proposal establishes the sixth class or 40 per cent of the first class on cotton bale covering and ties and buckles and fifth class or 45 per cent of first class on hay baling or binding ties when shipped in less than carloads. No change was recommended on carload shipments. The case was presented to the commission for reconsideration.

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River Shipments of Steel Up Slightly in September

Movement of iron and steel products on the Ohio River in the Pittsburgh district during September amounted to 49,269 net tons, compared with 49,164 tons during August and 109,129 tons in September, 1930. The United States Engineer Office, Pittsburgh, which reports these figures, places iron and steel shipments on the Monongahela River during September at 25,508 tons, against 14,522 tons in the preceding month, and 106,079 tons in September, 1930. Allegheny River shipments in September amounted to 8525 tons, against 5800 tons in August and 5100 tons in September, 1930.

Railroad Signal Makers Establish Export Office

WASHINGTON, Oct. 27.—The Signal Export Association has filed papers under the Webb-Pomerene Export act with the Federal Trade Commission to export railroad signal equipment and other apparatus. The association will maintain offices at 74 Trinity Place, New York. Officers of the association are: George A. Blackmore and Paul Renshaw, managers; Charles M. Muchnic, secretary, and B. P. Wayne, assistant secretary. Members are the Union Switch & Signal Co., Swissdale, Pa., and the General Railway Signal Co., New York.

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Malleable Castings Orders Declined

WASHINGTON, Oct. 27.—Orders for malleable castings declined to 17,595 net tons in September from 18,494 tons in August, according to reports made to the Bureau of the Census by 115 establishments. Production dropped to 18,161 tons from 18,531 tons and shipments fell to 18,374 tons from 20,513 tons.

In the first nine months of the current year, orders reported totaled 241,652 tons, against 397,770 tons in the corresponding period of last year.

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By-Product Coke Output Dropped in September

Total production of coke in the United States during September was 2,387,976 tons, or about 1,200,000 tons less than in the same month last year, according to the Department of Commerce, United States Bureau of Mines. By-product coke production last month was 2,310,176 tons, an average of 77,006 tons a day. Compared with August, the daily rate declined 2.3 per cent, and compared with September, 1930, there was a decline of 32.1 per cent. Production of beehive coke in September was 77,800 tons, an increase of 11.9 per cent over the August output.

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New Eastern Sales Agent for Sloss Pig Iron

F. W. Marshall & Co., Pennsylvania Building, Philadelphia, have been appointed exclusive Eastern sales agents for the pig iron of the Sloss-Sheffield Steel & Iron Co., Birmingham. The company continues to represent the Delaware River Steel Co., Chester, Pa., in the sale of its pig iron, and plans to establish a New York office in the future. Meanwhile, business in the New York district will be handled from Philadelphia.

Reduced Rates for Short Hauls Will Go Into Effect Nov. 10

Interstate Commerce Commission Grants Railroads Permission to Establish Lower Tariffs for Under 100 Miles

WASHINGTON, Oct. 27.—The Interstate Commerce Commission today granted railroads in Central Freight Association territory permission to establish reduced rates on iron and steel products for hauls of 100 miles and less. They are to become effective Nov. 10. It is assumed like permission will be asked by and granted to Trunk Line carriers.

Prescribed Scale of Rates on Manufactured Iron and Steel Articles in Carloads

(In Cents per 100 Lb.)

Miles (Inclusive)	Present Rate	Proposed Short Haul Rate	Rates Permitted by Oct. 20 Decision
0-5	6.0	3.0	3.3
6-10	6.5	3.75	4.125
11-15	7.0	4.5	4.95
16-20	8.0	5.25	5.775
21-25	8.5	6.0	6.6
26-30	9.0	6.5	7.15
31-35	9.5	7.25	7.975
36-40	10.0	8.0	8.8
41-45	10.5	8.5	9.35
46-50	11.0	9.25	10.175
51-55	11.5	10.0	11.0
56-60	12.0	10.5	11.55
61-65	12.5	11.25	12.375
66-70	13.0	12.0	13.2
71-75	13.5	12.5	13.75
76-80	14.0	13.25	14.575
81-85	14.5	14.0	15.4
86-90	15.0	14.5	15.95
91-95	15.5	15.25	16.775
96-100	16.0		17.6
101-105	16.5		18.15
106-110	17.0		18.7
111-120	17.5		19.25
121-130	18.0		19.8
131-140	18.5		20.35
141-150	19.0		20.9
151-160	19.5		21.45
161-170	20.0		22.0
171-180	20.5		22.5
181-190	21.0		23.0
191-200	21.5		23.5
201-210	22.0		24.0
211-220	22.5		24.5
221-230	23.0		25.0
231-240	23.5		25.5
241-250	24.0		26.0
251-260	24.5		26.5
261-270	25.0		27.0
271-280	25.5		27.5
281-290	26.0		28.0
291-300	26.5		28.5
301-320	27.0		29.0
321-340	28.0		30.0
341-360	29.0		31.0
361-380	30.0		32.0
381-400	31.0		33.0
401-425	32.0		34.0
426-450	33.0		35.0
451-475	34.0		36.0
476-500	35.0		37.0
501-525	36.0		38.0
526-565	37.0		39.0
566-600	38.0		40.0
601-635	39.0		41.0
636-665	40.0		42.0
666-700	41.0		43.0
701-735	42.0		44.0
736-765	43.0		45.0
766-800	44.0		46.0
801-835	45.0		47.0
836-865	46.0		48.0
866-900	47.0		49.0
901-935	48.0		50.0
936-965	49.0		51.0
966-1000	50.0		52.0
1001-1035	51.0		53.0
1036-1065	52.0		54.0
1066-1100	53.0		55.0
1101-1135	54.0		56.0
1136-1165	55.0		57.0
1166-1200	56.0		58.0

The new rates are the same as those proposed in the distance scale the carriers formerly have been allowed to make effective. This scale, however, was not applied because the commission required that the rates be made on a point-to-point basis. The carriers protested that this would require a vast amount of time and work in preparing new tariffs.

Under the new plan, the rates are built on a so-called conversion table. By this method the carriers make rates on a percentage of those now existing and so constructed that they are the same as those which were carried in the distance scale originally proposed. Under the new scale the base rate is 3c. per 100 lb. for hauls of five miles and less, against the present rate of 6c. The maximum haul of 100 miles will take the same rate as that now applying, 16c., but all rates for hauls up to 90 miles are reduced, some of them sharply.

Under the conversion table plan all that will be necessary to make the rates effective is to file supplements to existing schedules. This table is to be continued until April 15, 1932, when specific rates will be published. The carriers recently obtained an injunction suspending short-haul rates out of Pittsburgh. These suspended rates are the same as those which will apply under the conversion table plan. The carriers, of course, now will have the injunction vacated so that the rates will apply out of the Pittsburgh district as well as out of all other sections of the affected territory.

Decision Rendered on Rates for Circuitous Carriers

Meanwhile, the commission last Saturday made public another fourth section (long-and-short-haul) order covering the originally proposed rates on iron and steel for hauls of 100 miles and less. It dealt with circuitous routing not in excess of 70 per cent of the distance of the direct lines. The circuitous carriers, with their longer hauls, would be allowed to charge the same rates as applying over the direct routes with the shorter hauls. The scale set-up for the carriers having longer hauls begins at nine miles, for which the minimum rate of 3c. would be charged, and runs up to 170 miles for which the maximum rate of 16c. would apply. The commission provided that for the longer hauls distances between points may be used instead of distances from and to individual non-basing points. In making these provisions, the commission announced it does not approve any rates that may be filed under the order and that they are subject to complaint, investigation and correction if in conflict with any provisions of the Interstate Commerce act. These rates would apply until April 15, 1932.

If the conversion plan is put into effect the order apparently would be automatically voided since it seems to be the purpose of the carriers to revise the suspended Pittsburgh scale. Cast iron pipe is not included in the proposed short-haul rates.

The proposed circuitous scale would be as follows:

Cents	Miles	Cents	Miles
3	9	10	94
3¾	17	10½	102
4½	26	11¼	111
5¼	34	12	119
6	43	12¾	128
6½	51	13¾	136
7¼	60	14	145
8	68	14½	153
8½	77	15¼	162
9¼	85	16	170

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Hardinge Brothers, Inc., Occupies New Plant

Hardinge Brothers, Inc., Chicago, manufacturer of precision bench lathes, tool room lathes, bench milling machines and collets, has transferred its general offices and factory to a new plant at Elmira, N. Y.

The building of the plant was under consideration for many years to give additional floor space, with systematic arranging of the manufacturing equipment for efficient production of machine tools.

As the manufacture of a precision product requires skilled workmanship, most of the Hardinge employees were induced to move from Chicago to Elmira.

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Coming Meetings

November

American Management Association. Nov. 11 to 13. Industrial marketing conference. Hotel Statler, Cleveland. W. J. Donald, 20 Vesey Street, New York, managing director.

International Acetylene Association. Nov. 11 to 13. Thirty-second annual convention, Congress Hotel, Chicago. A. Cressy Morrison, 30 East Forty-second Street, New York, secretary.

American Institute of Mining and Metallurgical Engineers. Nov. 24 and 25. Open-hearth committee meeting. Book-Cadillac Hotel, Detroit. Leo F. Reinartz, American Rolling Mill Co., Middletown, Ohio, chairman.

National Founders Association. Nov. 18 and 19. Annual meeting. Hotel Astor, New York. J. M. Taylor, 29 South LaSalle Street, Chicago, secretary.

American Society of Mechanical Engineers. Nov. 30 to Dec. 4. Annual meeting, Engineering Societies Building, New York. Calvin W. Rice, 29 West Thirty-ninth Street, New York, secretary.

Charles F. Abbott Predicts Modification of Trust Laws

WHITE Sulphur Springs, W. Va., Oct. 27.—Demands upon trade organizations in the future will be much greater than in the past, declared Charles F. Abbott, executive director, American Institute of Steel Construction, in addressing the association today.

"The trade organization of the future will have to deal with such problems as employment and the maintenance of fair competitive relationships," he said. "The Swope plan, with certain refinements, will win adoption, I believe. The anti-trust acts will be modified probably in the next session of Congress. Industry does not ask for the protection of the inefficient, but it does demand that well managed companies be freed from the danger of destruction through cut-throat and uneconomic competition. It does not ask the elimination of competition, and it does not want Government intervention in its affairs, but it believes it should be given the legal right to so arrange its own affairs that selfishness, greed and unfair methods may be stamped out.

"The period of easy profits and quick fortunes has passed. The healthy growth of industry requires the provision of conditions under which efficient and well managed companies may prosper. In the structural steel field such conditions include one price to all on plain material, a selling price based on cost plus a profit, the elimination of extraterritorial dumping, the better balancing of output with demand and the persistent cultivation of new uses."

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Automobile Output in September 140,566 Units

WASHINGTON, Oct. 27.—The production of motor vehicles in the United States dropped to 140,566 units in September from 187,197 in August, according to Department of Commerce tabulations. The output of passenger cars was 109,087, against 155,321, while the production of trucks was 31,338, compared with 31,772. The taxicab output was 141, an increase of 37 over August. In the first nine months of the current year, the production of motor vehicles was 2,119,188, against 2,909,130 in the corresponding period of last year.

Canadian production in September declined to 2646 from 4544 in August, and consisted of 2108 passenger cars and 538 trucks. In the first nine months of 1931 the Canadian output was 77,502, against 138,622 in the corresponding period of last year.

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Small Foundries Gain in Production

Production of gray iron castings showed a gain of 0.6 per cent in September, having been 49.4 per cent of normal, compared with 48.8 per cent in August and with 65.7 per cent in September, 1930, according to the monthly report of the Gray Iron Institute.

Output by smaller foundries showed a gain of 16 per cent for the month, those with capacities up to 100 tons operating during September at 74.2 per cent of normal, compared with 58.3 per cent in August and 76.6 per cent in September last year. Foundries with capacities from 100 to 400 tons declined, and those with capacities of more than 400 tons increased production from 44.4 per cent to 45 per cent.

Plants in the Atlantic Coast States and the Chicago and Canadian districts reported decreased activity in September, while those in Ohio, Pennsylvania, Michigan and Indiana operated at the August level of 46.4 per cent. Wisconsin, Illinois and the territory west of the Mississippi River increased 3.2 per cent from 51.7 per cent to 54.9 per cent. New business and unfilled orders decreased slightly.

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Studies Changes in Steel in Tempering

A study of the tempering process in the heat treatment of steel containing 0.75 per cent carbon has recently been completed at the Bureau of Standards, using thermomagnetic analysis as a method for studying the changes which take place in the tempering range. Thermomagnetic analysis, or the study of magnetic changes upon the application of heat, reveals constitutional changes in the material which may be difficult to follow by other methods of analysis, and its application to the study of progressive changes in the tempering range has proved to be of some value.

The magnetic changes taking place in the quenched steel upon heating and while holding at certain constant temperatures are quite clearly revealed. These magnetic changes represent changes in constituents or in the structure of the material itself. The tempering of quenched steel is shown to be progressive dependent upon the tempering temperature and the time at that temperature. This investigation is described in the September number of the Bureau of Standards *Journal of Research*.

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Low Third-quarter Steel Earnings

EARNINGS of the United States Steel Corpn. for the third quarter were $9,181,091, compared with $13,817,524 for the second quarter and $19,464,836 for the first quarter. The earnings of the third quarter of 1921, the poorest of that year, were nearly $21,000,000.

On the basis of allowances for depletion, depreciation and obsolescence of $11,792,834, and bond interest of $1,362,092, there was a deficit for the quarter of $3,973,835. Special income was recorded of $7,160,966, "profit arising from sale of fixed property," identical with special income in the second quarter. This provided a net income for the quarter of $3,187,131. Dividend requirements of 1¾ per cent for the preferred stock and 1 per cent for the common stock, requiring $15,009,502, were declared, so that it was necessary to provide from the surplus the sum of $11,822,371.

The earnings for July were $3,661,751; for August, $2,960,293, and September, $2,559,047, showing successive decreases.

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Republic Steel Corpn. reports a net loss of $2,728,077 for the third quarter and of $5,512,975 for the first nine months of this year. However, T. M. Girdler, chairman, in a report to stockholders calls attention to the fact that depreciation charges for nine months amounted to $5,780,222, or considerably more than the net loss. The funded debt was reduced $1,996,300 during the nine-month period.

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Jones & Laughlin Steel Corpn., in the quarter ended Sept. 30, had net loss after all deductions including reserves for depreciation and depletion and bond interest, of $934,352. In nine months ended Sept. 30, net loss amounted to $733,511.

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Colorado Fuel & Iron Co. reports deficits of $949,251 for the third quarter, compared with $389,061 in the second quarter, and of $1,585,527 for the nine months ended Sept. 30, after all charges except Federal income tax and provision for equipment retired. These figures compare with deficit of $419,474 in the third quarter of 1930 and with profit of $844,259 for the first nine months of last year.

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"The Determination of Oxygen and Nitrogen in Irons and Steels by the Vacuum Fusion Method" is the title of research paper No. 346 of the United States Bureau of Standards. The authors are H. C. Vacher and Louis Jordan of the bureau.

....OFF THE ASSEMBLY LINE....

Automobile Industry Recovering Buoyancy on Eve of New Model Production

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DETROIT, Oct. 26.

ON the verge of plunging into its 1932 production campaign, the automobile industry has partially recovered its usual buoyant spirit. Nothing specifically has occurred to bring about this change in sentiment except perhaps the spectacle of a week passing without another break in the stock market. Apparently the nearer manufacturers draw to the beginning of their next year's programs, the more cheerful they feel; the bleak production days of September and October are almost a thing of the past, and many builders are of the opinion that with these meager, virtually empty days behind them, surely the worst of the depression has run its course.

However, there still are indications that November may be rather far advanced before improvement in output is noticeable. The key to the situation seems to rest in the hands of Henry Ford; even his competitors admit this. They are unwilling, in the first place, to show their hand until he has revealed to them a new mark to shoot at—a revamped model A. Beyond this, however, they privately ask how they can be expected to do much so long as the genius of Dearborn, with all of the resources at his command, is biding his time, content not to rush a new car onto the market over night.

The main Ford suppliers, such as Murray Corpn. and Briggs Body, are reported to have finished tooling up and preparing new dies for work on the Ford body and now are awaiting releases of orders before beginning operations. The same is true of plants furnishing castings. Releases are expected any day, but, until they come through, suppliers can only mark time. The steel trade is vitally interested in this situation, because releases of steel tonnages by suppliers depend on releases of parts by the Ford company. There continues evidence that Ford engineers have not yet decided on certain parts for the new car, although in general it is fairly well established that the car will be much heavier looking than present models, being built closer to the ground and possessing a longer wheelbase and longer body. With the position of suppliers taken into consideration, it now seems doubtful whether production of the improved Ford will be under way by Nov. 15, although it should be started before the end of the coming month. Meanwhile, the Ford steel plant at Dearborn continues closed.

Key to automotive situation is in hands of Mr. Ford. While he delays manufacture of his new car, other makers hold back their programs.

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Ford Motor Co. may not begin production of new car until some time after Nov. 15. Meanwhile, suppliers are tooled up, ready to start work as soon as Ford orders are released.

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Chevrolet's Flint plant is now manufacturing 1932 models. Gear and axle and forge plants have been making parts for new car for more than a week. Chevrolet's November output is not likely to equal last year's mark of 45,000 units.

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General Motors earned 25c. a share in third quarter, or $2.08 in the first nine months of the year, compared with 2.68 in the same period of 1930. Chrysler Corpn. showed net profit of 34c. in third quarter, raising its total for first three quarters to 85c., compared with 56c. in the same months of last year. Hudson and Hupp sustained heavy losses in third quarter.

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Chevrolet Starts This Week

Chevrolet is starting work at Flint this week on its 1932 car; the gear and axle and forge plants in Detroit have been making the new parts for more than a week. However, it is understood that all departments will not swing into manufacture so quickly as the steel trade expects, and at the present writing there is slight chance that Chevrolet output in November will attain the 45,000 mark set in the same month of 1930.

Just when the Chrysler divisions will be launching their activities on new models is not known. Dodge is almost at a standstill, assemblies at the Chrysler factory on Jefferson Avenue are light, and DeSoto is producing few cars at the moment. Plymouth is the busiest unit, but its output has dropped off sharply. Buick has given its second release of steel for its new car, the manufacture of which is progressing at a faster rate than the models of other makers. It is likely that the Buick will be the first car of the 1932 season to be presented to the public. Buick has just closed a remarkably successful year, considering the sharp reduction in motor car sales. In the year ended Aug. 1, it sold 113,438 cars.

Hudson should get started shortly. Changes in the Hudson and Essex lines are anticipated. Graham-Paige has moved some of its operations from Evansville, Ind., to its main body plant at Wayne, Mich. Oldsmobile and Oakland-Pontiac are said to be in the process of tooling up for new models. Some changes are expected in the Reo, although they are not likely to be extensive, since Reo went in for streamlining the past year, set-

ting the pace for its competitors in this respect.

Stutz at Indianapolis has announced a new line of cars at the lowest prices in the company's history, some models being $1200 less than comparable models the past year. Lincoln is reported to be expanding its models to include a 12-cylinder car. The eight-cylinder job will be lowered in price to compete with cars in the $2500 class. Murray Body already is turning out the new Lincoln bodies.

Inland Mills to Be at Disadvantage

If steel freight rates are increased by the railroads, inland mills will be put at a further disadvantage in competing with Lake front mills for Detroit business. It likewise will throw more business into the hands of motor truck haulers. Considerable steel from Cleveland and Youngstown is now shipped to Toledo and other points in northwestern Ohio by truck, while there is a constant stream of trucks loaded with steel moving from Monroe and Ecorse to Pontiac, Flint and other nearby Michigan manufacturing centers. The proposed rise on finished automobiles amounts to $2 a freight car on short hauls; since this amount would come out of the pockets of dealers, it is believed that it will lead to a gain in truck-aways and drive-aways. The recent decrease in railroad rates on finished automobiles has been disappointing, so far as increasing the volume is concerned, partly because it was instituted when shipments were declining on account of the depression and because the new rates were still too high to many points to take business away from the trucking companies.

Third Quarter Earnings Poor

Financial statements of motor car makers leave much to be desired. General Motors earned 25c. a share in the third quarter, one-third of its dividend requirements, compared with 53c. a share in the same quarter last year and $1.22 in the second quarter. Its earnings in the first nine months of the year were $2.08 a share, contrasted with $2.68 in the same period of 1930. For the September quarter, Hupp Motor Car Corpn. reported a loss of $895,184, or almost twice the loss in the same quarter of last year. Hudson's large deficit in the third quarter more than offset the small profit made earlier in the year, so that in the first nine months it sustained a slight loss. The best showing so far is by Chrysler Corpn., which had a profit of 34c. a share in the third quarter, against 73c. a share in the previous quarter and a loss of 21c. in the corresponding quarter of 1930. Net earnings for the first nine months were equal to 85c. a share, compared with 56c. in the same period of last year. The new Plymouth is said to be largely responsible for this good record. Almost all automobile companies, including those sustaining losses, are in strong cash position.

Fabricated Steel Orders Gained in September

WASHINGTON, Oct. 27.—Fabricated structural steel bookings in September reported to the Bureau of the Census by 235 establishments rose to 178,120 tons from 111,939 tons reported in August by 233 concerns. Estimated total bookings were 196,800 tons, or 49.2 per cent of capacity, against 124,400 tons, or 31.1 per cent of capacity in August.

Shipments reported for September by 230 establishments totaled 110,548 tons, compared with 123,098 tons reported for August by 228 fabricators. Estimated shipments were 150,000 tons, or 37.5 per cent of capacity, against 168,800 tons, or 42.2 per cent of capacity in August.

Bookings reported in the first nine months of 1931 were 1,418,569 tons. For the corresponding period of last year, reported bookings were 1,916,960 tons. Estimated bookings for each of the two periods were 1,608,400 tons and 2,176,400 tons respectively.

Shipments reported in the first nine months of the current year were 1,039,315 tons, against 1,692,686 tons in the corresponding period of last year. Computed deliveries for each of the two periods were 1,458,800 tons and 2,384,400 tons.

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Acetylene Association to Meet in Chicago

Discussion of virtually all classes of oxy-acetylene welding practice will occupy sessions of the International Acetylene Association's thirty-second annual convention to be held at the Congress Hotel, Chicago, Nov. 11 to 13. The first of the seven technical sessions, devoted to subjects of general interest to welders, will include the papers on: "Welding and Its Future," by Prof. C. A. Adams, Harvard University and director, American Bureau of Welding; "Phases of Gas Welding," by G. O. Carter, Linde Air Products Co., New York; and "Gas Welding Opportunities Under the Revised A.S.M.E. Boiler Code," by C. E. Gorton, president, Uniform Boiler Law Society, New York.

Applications of welding in the transportation, piping and chemical industries will be discussed at three separate sessions. Dr. Hugo Arnstein, chief engineer, Akron, Ohio, will describe welding operations on the United States airship Akron; in the field of automobile transportation, J. L. Anderson, Air Reduction Sales Co., New York, will outline machine welding of tubing for automotive parts. A paper by H. E. Rockefeller, Linde Air Products Co., New York, on recent developments in welding overland pipe lines will be illustrated with motion pictures. The welding of corrosion resisting alloys for use in the chemical industry will be described by a representative of Lukenweld, Inc., Coatesville, Pa.

Demonstration of nine different tests of welded work will feature the session on Wednesday evening, Nov. 11. Invisible-ray, magnetic, hammer, visual inspection, tensile and abrasion tests will be among those conducted by J. J. Crowe, Air Reduction Laboratories, Inc., New York, and engineers of the Union Carbide & Carbon Research Laboratories, Inc., Long Island City, N. Y. Prizes will be awarded to members estimating most correctly the strength of welded coupons. At the same session, H. L. Whittemore, Bureau of Standards, Washington, will explain the growing importance of tests and what they mean to the welding industry.

"What Engineering Graduates Should Know About Welding" will be discussed by E. Lunn, consulting engineer, Chicago, at a session devoted to education of welders. Other speakers include Dean A. A. Potter, Purdue University, and W. H. Ludington, Air Reduction Sales Co., New York.

The Morehead medal for advances made in the methods of producing or utilizing calcium carbide or its derivatives, awarded this year to A. Cressy Morrison, secretary-treasurer of the association, will be presented during the final session which will be devoted chiefly to committee reports and the election of officers.

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Shipments of Sheets Declined in September

Sales and production of steel sheets by independent mills during September showed little change from August, according to the monthly report of the National Association of Flat Rolled Steel Manufacturers. However, shipments declined. Sales during September were 120,688 tons, against 122,849 tons during the previous month, and production was 116,842 tons, against 123,752 tons in August. Shipments fell to 123,371 tons, compared with 151,529 tons during the previous month. Unfilled orders on Oct. 1 declined slightly. The September report and comparison in net tons follow:

	Sept.	Aug.	July
Sales	120,688	122,849	144,461
Production	116,842	123,752	174,890
Shipments	123,371	151,529	178,460
Unfilled orders	167,366	170,122	203,358
Unshipped orders	75,816	74,245	83,006
Unsold stocks	67,337	75,288	77,953
Capacity per month	540,600	525,100	558,850
Percentage reporting	67.6	67.6	67.6
Percentages, Based on Capacity			
Sales	33.0	34.6	38.2
Production	32.0	34.9	46.3
Shipments	33.8	42.7	47.2
Unfilled orders	45.8	47.9	53.8
Unshipped orders	20.8	20.9	22.0
Unsold stocks	18.4	21.2	20.6

... PERSONALS ...

WILLIAM P. WITHEROW has resigned as vice-president of the Republic Steel Corpn., Youngstown, to devote his time to private interests. Mr. Witherow was president of the Witherow Steel Corpn., Pittsburgh, prior to its merging with the Donner Steel Co., Buffalo, after which he served as chairman of the board of the Donner company. He has been vice-president of the Republic organization since it absorbed the Donner company early in 1930. Mr. Witherow is a director in the Spencer Mfg. Co., Spencer, Ohio, the Mid-West Forge Co., Cleveland, the Pittsburgh Coal Co., Pittsburgh, the First National Bank at Pittsburgh, and the Peoples-Pittsburgh Trust Co. He is also vice-president of the Chamber of Commerce of Pittsburgh, and prominently identified with many other civic and business affairs in that city.

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ARTHUR T. CLARAGE, president, Columbia Tool Steel Co., Chicago Heights, Ill., was nominated for treasurer for two years of the American Society for Steel Treating at the annual meeting in Boston the latter part of September. Mr. Clarage received his general and technical education in the public schools of Chicago and in 1914 joined the chemical laboratory staff of the Columbia company. In 1916 he was transferred to production work in connection with the expediting and inspection of war material, and later he assumed technical control of production. In 1920 he was made general manager of the company and five years later was elected president. Mr. Clarage's activities in the American Society for Steel Treating have been numerous. He was a member of the executive committee of the Chicago chapter during 1927 and 1928, and for two years was active in the work of the national finance committee of the society. He is also a member of the American Institute of Mining and Metallurgical Engineers, the American Iron and Steel Institute and the Engineers' Club of New York.

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RICHARD L. CAWOOD, president, Patterson Foundry & Machine Co., East Liverpool, Ohio, has been elected president of the Potters National Bank & Trust Co., East Liverpool. He is also president of the Patterson Steel Products Co. and other companies.

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GEORGE P. PILLING, formerly of Pilling & Co., pig iron, recently liquidated, and SAMUEL E. DOAK, mining engineer, at one time associated with W. W. Hearne, pig iron, Philadelphia, and more recently in business for himself as a consulting engineer, have associated themselves as industrial engineers. The firm will have offices in the Franklin Trust Building, Philadelphia, and will work with manufacturing companies and through the banks in appraising, operating and managing companies needing special attention.

W. P. WITHEROW

A. T. CLARAGE

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O. A. AHLERS has been appointed purchasing agent of the City Machine & Tool Works, Dayton, Ohio. He previously was associated with the International Tool Co. as assistant secretary-treasurer and purchasing agent, but prior to that engagement was with City Machine & Tool Works.

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HARRY SLOAN, advisory engineer, Vilter Mfg. Co., Milwaukee, has been elected president, Engineers' Society of Milwaukee. FRASER JEFFREY, electrical engineer, Allis-Chalmers Mfg. Co., was the choice for vice-president.

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ALVAN T. SIMONDS, president of the Simonds Saw & Steel Co., Fitchburg, Mass., was the guest of the Hartford, Conn., chapter of the National Association of Cost Accountants and of the Manufacturers' Association of Connecticut at the Elm Tree Inn, Framington, Conn., on Oct. 20. Mr. Simonds expressed the belief that the bottom of the depression has been reached, but believes that wages must be reduced before the situation can be cleared up. He is not in sympathy with our high tariff, and recommends a reduction as an aid to business recovery.

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MYRON C. TAYLOR, chairman of the finance committee of the United States Steel Corpn., will deliver an address at the opening session of the third international conference on bituminous coal, to be held at Carnegie Institute of Technology, Pittsburgh, Nov. 16 to 21.

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FORREST G. HARMON has been appointed manager of sales of the tubular goods department of the Columbia Steel Co., succeeding the late George S. Garritt. Mr. Harmon joined the National Tube Co. at Pittsburgh following his graduation from college and on June 1, 1926, was sent to San Francisco to enter the department which he now heads. T. W. BROOKS, former assistant manager of sales in the same department, has retired after 54 years of continuous service with the company. He joined the National Tube Co. at Pittsburgh in 1877, and in 1888 was sent to California. He is succeeded by A. T. COOPER, who has also served many years with the National Tube Co., both at Pittsburgh and at San Francisco.

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HAROLD E. GRAY, sales manager of the Pacific Coast Steel Co., Bethlehem affiliate on the Pacific Coast, last week addressed the San Francisco Advertising Club on "The Steel Industry."

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STEVEN J. MENZEL has joined the engineering department of Graham-Paige Motors Corpn., Detroit, as stamping engineer. For a year and a half he was sales manager of the stamping division of the Briggs Mfg. Co., Detroit, and previously was sales manager for the Mullins Mfg. Co., Salem, Ohio, with whom he served eight years.

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MILTON T. CLARK, formerly vice-president of the Truscon Steel Co., Youngstown, and heretofore president of the Campbell Industrial Window Co., a division of American Radiator-Standard Sanitary Corpn., has been elected president of the Vitaglass Corpn., New York.

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W. L. HAYNER has been named general manager of the Algoma Foundry & Machine Co., Algoma, Wis. He succeeds B. F. LARKIN, who has taken

charge of the Waukesha, Wis., branch of the Oliver Plow Co.

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RAY G. WHITE has been appointed Eastern sales representative of the Electric Furnace Co., Salem, Ohio. He was formerly with the Mahr Mfg. Co. and has had over 10 years' experience in the industrial furnace field. He will have charge of both electric and fuel furnace sales in northwestern Pennsylvania, eastern New York and the New England States, with headquarters at 55 West Forty-second Street, New York.

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E. T. BENNINGTON has resigned as manager of the tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, Ohio.

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HARRY H. HANNUM, for the past six years with the Hannum Mfg. Co. and its predecessor, the Lavine Gear Co., Milwaukee, manufacturer of steering gear assemblies for motor trucks and tractors, has been made purchasing agent of the Heintz Mfg. Co., Philadelphia, maker of steel automobile bodies and stampings. GLEN G. HOLT, for many years associated with the Hannum company, has joined the Heintz company.

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GEORGE H. CORLISS, who has been identified for the past 15 years with the S. A. Woods Machine Co., Boston, has been appointed sales promotion manager of the J. A. Fay & Egan Co., Cincinnati, manufacturer of wood-working machinery.

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A. C. SLADKY has resigned as assistant general manager of manufacturing of the National Enameling & Stamping Co., to become factory manager of the Perfex Corpn., Milwaukee.

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CARROLL DEV. MILLER, who has been active as an independent manufacturers' agent of materials-handling equipment, Buffalo, has been made manager of the eastern branch, at Philadelphia, of the American Monorail Co., Cleveland. After being graduated from Purdue University as a mechanical and electrical engineer, he was for a time identified with the General Electric Co. Mr. Miller succeeds the late L. E. Gaston.

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HARRY S. SLEICHER, formerly vice-president of the North American Refractories Co., Cleveland, has become identified in a sales capacity with the New York office of the General Refractories Co., Philadelphia.

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L. J. VOYER has been appointed Western sales manager, with offices at 208 South LaSalle Street, Chicago, of the N. & G. Taylor Co., Cumberland, Md. He was associated with the American Sheet & Tin Plate Co. for 15 years and during the past six years has been district sales manager of the New York, Youngstown, and Cleveland offices of the Newton Steel Co.

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EARL CAMPBELL has been made manager of the jobbing department of the F. H. Lawson Co., Cincinnati, distributor of Armco products, and E. G. HARVEY has been placed in charge of specialty sales in the Cincinnati district. Mr. Campbell formerly served as manager of the jobbing departments in Louisville, Ky., Cincinnati and Detroit of the Follansbee Brothers Co., Follansbee, W. Va.

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H. A. EVERETT, heretofore professor of thermodynamics at Pennsylvania State College, has been appointed head of the department of mechanical engineering.

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L. W. ERICKSON has been appointed district representative in the Milwaukee and Wisconsin territory for IXL gears and speed reducers made by the Foote Brothers Gear & Machine Co., Chicago.

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H. W. KILKENNY, formerly of the Ohio Brass Co., on Nov. 1 will become associated with his brother, J. G. KILKENNY, to represent in the Cleveland district the Central Tube Co., Pittsburgh, the W. N. Matthews Corpn. and the Moloney Transformer Co., both of St. Louis.

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DAVID F. AUSTIN, formerly assistant manager of sales in the Cincinnati district for the Carnegie Steel Co. and the Tennessee Coal, Iron & Railroad Co., has been made manager of sales, Cincinnati district, of these companies and also of the Illinois Steel Co., succeeding the late George H. Vant. WILBER G. SOMES has been appointed assistant manager of sales in that district for the Carnegie and the Tennessee companies.

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RALPH LEAVENWORTH, heretofore assistant general sales manager of the Austin Co., Cleveland, has been appointed general advertising manager of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

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HENRY A. GAMELIN, formerly advertising manager for the Bullard Co., Bridgeport, Conn., has resigned to cover advertising and marketing for the U. S. Industrial Alcohol Co., New York. He was sales and advertising manager for the Automatic Machine Co., Bridgeport, previous to the Bullard connection, and before that was with the New Departure Mfg. Co. at Bristol, Conn. He succeeded E. PAYSON BLANCHARD as advertising manager of the Bullard Co. when Mr. Blanchard was promoted to the position of assistant sales manager.

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FREDERICK W. WILLARD, formerly assistant works manager of the Western Electric Co., Kearny, N. J., has been appointed executive vice-president of the Nassau Smelting & Refining Co., Tottenville, Staten Island, N. Y., which has been acquired by the Western Electric Co.

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JOHN A. MORITZ, general superintendent of the Crawfordsville, Ind., plant of the Mid-States Steel & Wire Co., has been named a member of the board of directors of the company.

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▲ ▲ ▲ OBITUARY ▲ ▲ ▲

EDMUND J. BAKER, production manager of the Kinney Mfg. Co., Jamaica Plain, Boston, died at his home there on Oct. 17. He was born in Lebanon, N. H., 69 years ago.

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LEE W. BARBER, president of the Standard Car Truck Co., Chicago, died Oct. 20 at Monrovia, Cal., after a short illness. Mr. Barber had been connected with the Car Truck company for 35 years and was active in the conduct of the business until a month ago.

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RICHARD T. MARTER, superintendent, National Enameling & Stamping Co., Milwaukee, died Oct. 19, aged 66 years. He joined the Milwaukee plant as an apprentice and was soon to have celebrated the completion of 50 years of association with the company and its predecessors.

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GEORGE M. TREFTS, president, Farrar & Trefts, Buffalo, died on Oct. 18, aged 84 years.

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REUBEN MILLER, formerly vice-president of the Crucible Steel Co. of America, died on Oct. 23 at his home in Pittsburgh, aged 59 years. He was born in that city and attended Yale University, from which he was graduated in engineering. His first employment was with the old Crescent Steel Co., of which his father was then president. When this organization was taken over by the Crucible company, he became a vice-president of the latter organization and served it until his retirement a few years ago.

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OTTO KOHLER, president and one of the organizers of the Meadville Malleable Iron Co., Meadville, Pa., died on Sept. 11.

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CHARLES F. DAVIS, for 16 years treasurer of the Stafford Iron Works, Inc., Worcester, Mass., and associated with the Fleming Machine Co. of that city, died Oct. 12, aged 48 years.

Testing Society to Hold Three New York Meetings

The advisability of bringing members of the American Society for Testing Materials into more direct contact with the activities of the society prompted the executive committee to sponsor district or regional meetings to bring this about. The first meeting in the New York metropolitan district was held on March 15, 1931. [THE IRON AGE, March 12, 1931.] Plans for the 1931-32 season have since been formulated. Prior to the annual meeting next June there will be three dinner-technical meetings as follows:

"Non-Metallic Protective Coatings" will be the topic at the fall meeting, Nov. 5, 1931.

"Metals" will be the topic at the winter meeting, to be held Feb. 19, 1932, in cooperation with institute of metals division, iron and steel division and the New York chapter of the mining engineers.

"Recent and Prospective Developments in Engineering Materials" will be the topic at the spring meeting to be held in April.

The fall meeting is to be held Thursday, Nov. 5, 1931, at the Hotel Paramount, New York. The technical session will convene in the Oceanic room at 8 p. m. and the following program has been arranged:

"THE HISTORY OF PROTECTIVE COATINGS," by DR. MAXIMILIAN TOCH, *president, Toch Brothers, Inc.*

"THE ECONOMICS OF PAINT," by DR. HENRY A. GARDNER, *director scientific section, educational bureau, American Paint and Varnish Manufacturers Association.*

"THE FAILURE OF NON-METALLIC COATINGS," by DR. JAMES K. HUNT, *experimental station, E. I. duPont DeNemours & Co.*

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To Hold Market Research and Export Conference

Industrial marketing will be discussed at a two-day meeting of the marketing division of the American Management Association, to be held at the Hotel Statler, Cleveland, Nov. 11 and 12. Following this, on Nov. 13, the Northern Ohio Export Conference will hold sessions.

Papers at the opening meeting of the marketing division will include "Defining and Locating the Buyer and the Line of Buying Influence," by R. W. Staud, Benjamin Electric Mfg. Co., and a discussion of the topic by G. H. Corey, advertising manager, Cleveland Twist Drill Co. In the afternoon, R. S. Perry, vice-president, Ingersoll Milling Machine Co., will speak on "How May Engineering Service Be Made Most Effective as an Aid in Selling?" and E. S. La Rose, assistant controller, Bausch & Lomb Optical Co., on "Industrial Marketing Research and Budgeting." C. O. Drayton, general sales manager, Graton & Knight Co., will preside. An address on "Statistical Data Needed in Measuring Market Demand," by T. M. McNiece, Union Carbide & Carbon Co., will feature the dinner meeting.

"Industrial Market Analysis for and by Salesmen," a paper by D. M. Strickland, American Rolling Mill Co., planned for the morning of Nov. 12 will be followed by "Installment Selling of Industrial Equipment" by H. B. Lewis, Commercial Credit Co. A. B. Einig, general manager, Motch & Merryweather Co., will discuss Mr. Lewis' paper.

A dinner meeting with P. E. Bliss, president, Warner & Swasey Co., presiding and Dr. Dexter S. Kimball, dean of engineering, Cornell University, the principal speaker, has been arranged for the evening of Nov. 12. Doctor Kimball will talk on "Interplay of Factory Equipment Modernization and Industrial Sales Stability."

L. W. Greve, president, Cleveland Pneumatic Tool Co., will preside at the opening session of the Northern Ohio Export Conference. Papers include: "Engineering Service as Applied to Export Selling," by C. R. Cary, vice-president, Leeds & Northrup Co.; "Personnel Management in the Foreign Field," by F. W. Copeland, vice-president, Sullivan Machinery Co., and "Shall Exporting Be Done Through Agents or Dealers or Direct?" by H. J. Leisenheimer, vice-president in charge of foreign sales, Cleveland Tractor Co. G. S. Case, president, Lamson & Sessions Co., will preside at the afternoon session.

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Urges Fabricators to Weld Machine Parts

"Welding for Profit" was discussed before the ninth annual convention of the American Institute of Steel Construction at White Sulphur Springs, W. Va., Oct. 27, by P. J. Horgan of the General Electric Co., and Robert E. Kinkead, consulting engineer, Cleveland. Following the presentation of their papers the subject was discussed by F. T. Llewellyn, of the United States Steel Corpn.

Mr. Llewellyn pointed out the futility of conflict btween the larger and the smaller fabricating shops as to which should supply the demand in the comparatively narrow zone where their capacities overlap. He stated that energies could be more profitably concentrated on the development of new fields for the use of structural steel that afford ample tonnage for all and require only minor additions to existing shop equipment.

He stated that a most notable field is opening for the application of rolled steel to the construction of machine parts, whose volume exceeds the entire fabricating capacity of the country. These parts, whose shape formerly required the use of cast iron, can now be produced out of rolled steel with the aid of the gas cutting and fusion welding processes that have been recently developed.

The speaker expressed the opinion that the present equipment in structural fabricating shops lends itself to their use also as welderies from which unfinished machine parts can be turned out and delivered to the machine builders for finishing and assembly.

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Alloys to be Featured in Case School Conference

The first of three industrial conferences planned by the Case School of Applied Science and the Cleveland Engineering Society will be held at the Case School in Cleveland on Nov. 18, 19 and 20. This initial symposium will be devoted to discussions of metals and alloys.

Subjects to be discussed will include "Stainless Steels," by Dr. M. A. Grossman, vice-president, Republic Research Corpn.; "Monel Metal and the Nickel Alloys," by T. H. Wickenden, International Nickel Co.; "Metallurgy of Alloys," by Dr. A. A. Bates, Case School of Applied Science; "Brass, Bronze and Copper Alloys," by W. R. Hibbard, American Brass Co.; "Zinc and Its Alloys," by W. M. Pierce, New Jersey Zinc Co., and "Aluminum and Its Alloys," by L. W. Kempf, Aluminum Co. of America.

Additional information regarding the conference may be obtained from Fred L. Plummer, care of Case School of Applied Science, Cleveland.

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Magnetic Chucks

(*Concluded from page* 1115)

magnetic field has been generated.

By the use of auxiliary devices or extensions from the pole pieces of the chuck, work of irregular shapes may be held, and special chucks are frequently designed for this purpose. Owing to the limited holding surfaces usually available on irregular pieces, it is important that a chuck having maximum holding power and minimum variation of holding power over the entire face area be used. Such a chuck, for the grinding of layends on a heavy-duty face grinder employing a 56 in. diameter block grinding wheel, is shown in Figs. 4 and 5. In this illustration six of the layends are in place on the chuck after the grinding has been completed, while three have been removed to show the arrangement of the holding device.

Has Credit Inflation Affected the P-V Line?

BY DR. LEWIS H. HANEY
DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

DURING the past month the P-V line has risen slightly above our estimate of "normal." In view of the continued depression and the lack of any convincing evidence of an upturn in business activity, this fact raises two important questions.

First, is the estimated normal for this barometer incorrectly determined? Or, has the normal level been changed by recent developments? Either of these questions may possibly be answered in the affirmative. There is an arbitrary element in the determination of any "normal" level, and that for the P-V line may have been placed a little too low. Or, it may be that a change in the volume of bank credit may have affected the circulating medium so that the level of prices at which demand and supply can be balanced has risen.

Is the existence of inflation indicated? Since no other business barometers point upward, and the unfavorable factors are still preponderant, the rise in the P-V line may be explained by an increase in credit such that the purchasing power of the dollar is reduced, independently of any change in the quantity of commodities or services exchanged, or in the intensity of consumers' desires.

There is some reason to believe that a force other than factors affecting directly the rate at which one commodity exchanges for another (including gold) has come into play. The loans and investments of the member banks are now extraordinarily large in comparison with any indication of business requirements for bank credit. Whether we compare their present level with payrolls or foreign trade or wholesale trade or department store sales. this conclusion holds.

If we estimate the trend of the total dollar-value of industrial production, the same conclusion holds. Even in comparison with bank debits, the total loans and investments of the member banks are very high. And the turnover of bank deposits is abnormally low.

Moreover, the extent to which our secondary line of credit has been impinged upon is noteworthy. While gold reserves have been greatly reduced by exports and domestic hoarding, Federal Reserve note issues have increased sharply and are a billion dollars above a year ago. The reserve ratio has fallen sharply. Obviously, the element of credit in our circulating media has increased. Moreover, the member banks have increased their borrowing (and their reserve deposits).

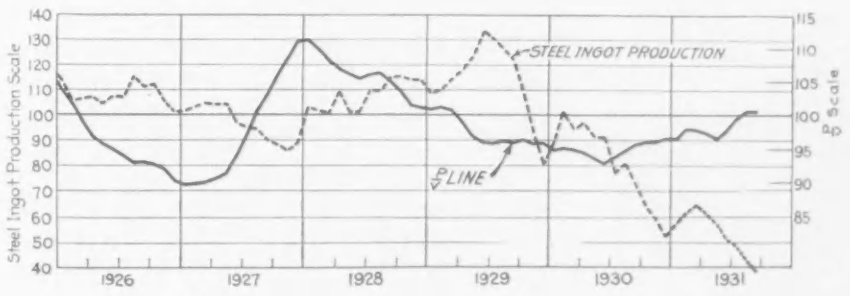
At the same time, the ratio of total loans and investments of member banks to their total deposits has increased sharply and, at over 112 per cent, has risen to approximately the 1929 level.

It, therefore, seems not improbable that part of the rise in the P-V line which has occurred *since last June* is inflationary in character.

As regards the gradual stabilization and edging upward of the P-V line since July, *1930*, this is entirely favorable. It reflects that gradual strengthening of the relationship between demand and supply which develops in the later stages of a business recession. Were there no elements of inflation present, it could be said with considerable certainty that the bottom of this cycle has been very nearly reached, so that stabilization and gradual recovery might be expected within a relatively few months.

As it is, however, we can not be so sure. The disturbance to the world's monetary structure, which centers in the suspension of gold payments by England, has produced profoundly important effects. These include a sudden drain upon this nation's gold reserves, accompanied by the injection of a large amount of reserve notes, and by the serious consideration of inflationary devices designed to extend Government credit in many directions.

If the rise in the P-V line is not due to inflation, it is a very hopeful indication. If not inflationary, it would mean that, without any material variation in our monetary standard, the demand for and supply of commodities in general has approached a stabilization level, and that stronger commodity markets would before long develop without any uncertainty as to the purchasing power of the dollar. If, however, the rise in the barometer *since June* has been due to a "creeping inflation" in bank credit, it may, while being "bullish" for the near future, indicate a temporary spurt which could eventuate in another period of deflation.



DOES improvement in the P-V line indicate approach to the end of recession? It may be that the estimate of normal is in error. Possible inflation of bank credit is suggested.

W. W. MACON
Editor

THE IRON AGE

A. I. FINDLEY
Editor Emeritus

(ESTABLISHED 1855)

Call for Cuts in Railroad Labor

WHAT seems clear in the matter of the railroad rate case is that the relief the railroads sought must now be obtained through wage reductions. The specific higher freight charges that the Interstate Commerce Commission would allow under its decision of last week were evidently closely calculated to provide a return sufficient merely to prevent insolvency. And they were figured also to apply to the whole transportation system, requiring the more efficient and more active lines to throw surplus monies into a pool for the common good.

When and if a working arrangement is drawn up and approved, the roads still will face the need of greater revenues to secure new equipment, not to say to cover wear and tear replacement. Unless something else happens, the railroad equipment suppliers can hardly get much hope from the early outlook and the financial community gets not much more than a breathing spell.

Thus there will be little dissent from a demand for a cutting of rail labor wage rates. Railroad wage earners, along with wage earners in general, have suffered in shortened work-weeks, although in this respect not at all as much as most, but they stand alone as an important group whose hourly pay has had no paring whatever.

Public sentiment by this time is veering to the side of reduction, and that being so, no serious political rallying should be expected around the railroad brotherhoods. If these brotherhoods were wise, they might take the initiative toward a moderate cut to stave off something deeper.

Commerce and industry demand the adjustment, and resistance to the demand must be taken as a measure of the forces seeking to put the railroads into government ownership. Settlement of railroad wages is therefore important beyond any effect it may have toward the completion of deflation or any help toward an expansion of industrial activity; delay and resistance in this matter carry an omen with regard to the future status of the carriers.

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Keeping the Men at Work

NOT an employee has been discharged except for causes which would have been valid two years ago. Furthermore, no man's hourly wage has been cut (but salaries have). Such is the record of a well known metal-working plant in Buffalo.

Though the plant is working at only about 30 per cent of capacity (October, 1931), every man is assured of his share of all the work going forward. Naturally, some departments are busier than others; men in those fortunate branches fare better than their fellows. But no one is left completely without an earned income.

One device which has borne good fruit all through the open season is a little unusual. Those men who were able to secure work on construction jobs were given leaves of absence by the company. They were not removed from the payroll lists, and thus were permitted to maintain unimpaired their status under the group life insurance plan on which the plant is operating. Not a few of the men made such arrangements, thus leaving a larger share of the plant's work for the rest.

This case, while perhaps unusual in its completeness in caring for the men's jobs and wage rates, has perhaps been duplicated in many plants. In fact, one very salutary development in the present emergency has been the widespread application of the principle of the rotation of jobs, even to the whole working force in many cases. So-called key men were rotated when the employer had thought it impossible to do so. The Rochester employment benefit plan, as explained at last week's machine tool builders meeting by President Gleason of the Gleason Works, produced rotations far beyond expectations. The experiences make a heartening contrast with those in all previous depressions.

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Market Problems to the Fore

A SPEAKER at the recent national production meeting of the Society of Automotive Engineers at Detroit, as reported in THE IRON AGE of Oct. 15, urged that "the whole industry, including the production division, become salesminded, for the sales problem today and in the future far outweighs in importance the production problem."

With all allowance for the variables in the popular taste that so largely affect the automobile sales appeal, this observation has a very definite pertinence to the whole metalworking field. The major uncertainties in the minds of industrial managers today, as they try to plan for the next turn in the rough road they have been traveling, are not so much those of production methods as of buying power and buyer preference.

In the effort to determine their future scale of operations executives need in an unprecedented way to be able to measure the forces at work in this depression that, in the common thinking, mark it as the introduction to a new dispensation, economic and social. Employers have been called upon by leaders of labor to assure their present employees that they will be kept on the payroll, at least that they will have work through the coming winter. A few cor-

porations of commanding size and strength have announced such a guaranty. Many others have made such records in the past two years for putting ahead of every other consideration the fullest possible employment of the workers that the latter have little of the fear that to thousands has become an every-day menace. Sales organizations in any case have to reckon not only with the much reduced consumption which marks the immediate depression phase of the cycle, but with the greater uncertainty as to the shifts in demand which will come in the new era for which the hard times have been preparing us.

In trying to maintain employment not a few manufacturers have produced for stock to an extent that first and last is taxing in an extraordinary way the resourcefulness of sales departments. The fact that for the most part—so far as the metalworking industry is concerned—such stock production has been of standard apparatus does not lighten the sales problem. "Standard" equipment may require redefinition in the new era that is to succeed the depression.

Just now, when a great credit pool is created to aid in liquefying bank assets that have been frozen for the past two years, and when the buying power of ultimate consumers is at its lowest ebb, emphasis on future sales policies may seem premature. But for a good while we have been hearing an insistent call for leadership in solving an even remoter problem—that of finding new channels into which our great surplus of producing power can be turned, so that our millions of unemployed may have work. Plainly such creation of new wants must wait on restoring confidence to the point of freer satisfaction of old wants.

And in that process of restoring confidence, not only sales but production and financial executives will find a major challenge in the problem of consumer credit. Working together, they may even find a way to make instalment selling, which through the joint folly of producer and consumer did so much for the undoing of business in 1928 and 1929, actually become an aid to business recovery in 1932.

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This Year's Steel Tonnage

AT the institute meeting last Friday Mr. Schwab made an estimate that this year's steel ingot output will total about 25,000,000 tons. This represents quite well a balancing of chances as to what the remainder of the year will bring forth, and is quite close enough for comparison with other years by reason of the great disparity, last year having totaled 39,595,268 tons while the record was 54,850,433 tons, made in 1929. Barring 1921 and 1914 there has not been so small a year since 1909.

Inasmuch as there are predictions that steel production will increase after this month, instead of following its usual year-end downward course, it is of interest to note how variations will affect the total. Production of all ingots, on the basis of prorating the 5 per cent or thereabouts of Bessemer and open-hearth capacity not reporting monthly, and allowing for electric and crucible ingots, was approximately 20,575,000 tons in the first nine months of the year.

To make a total of 25,000,000 tons for the year an average rate of about 26½ per cent of capacity would be required for the last three months. Thus it would require some seasonal decrease in the next two months to make the total so low. On the other hand, an average of slightly over 32 per cent in October, November and December would be needed to make the total of 26,000,000 tons. At the best, November and December are not expected to bring an increase sufficient to make the quarter's average so high.

One may conclude that it would require a distinct decrease in the next two months to run the total under 25,000,000 tons while a fair sized increase henceforth would point to about 25,500,000 tons.

Assuming a 25,000,000-ton total for convenience, contributions of the respective quarters would be 32, 29, 21 and 18 per cent of the total respectively.

Merely a glance at the monthly ingot statistics since the war shows how strong a tendency there has been for production to increase during the first three or four months of a year. Whether the old year ended poorly or well, a high rate would be struck in March or April. December rates have varied much more widely than March rates. If a year ended poorly, a greater percentage increase occurred than if a year had ended well.

According to precedent, therefore, it would not seem to matter much whether the next two months do better or worse. The new year might have a good start behind it, but it should take care of itself without the start.

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The Views of Organized Labor

THE American Federation of Labor has just concluded, at Vancouver, its annual convention. Membership in the Federation is now about 2,900,000, inclusive of the United States and Canada. The railroad brotherhoods comprise about 400,000 additional. The total enrollment in organized labor constitutes therefore only a small part of the total number of workers other than agricultural; considerably less than 10 per cent. Its importance is increased, however, from the fact that a good part of unorganized labor entertains the same views and from the inclusion of a relatively large number of the more skilled artisans. Roughly a third of the Federation membership consists of carpenters, bricklayers and other builders, who constitute more or less one-third of that class of workers. A good deal of the business at Vancouver had to do with jurisdictional disputes between the carpenters, bricklayers and electricians on the one hand and the other builders on the other hand.

In the outlining of broad economic policies, however, all internal controversies were submerged and all agreed upon measures for promoting and prolonging the economic depression, although of course that is not the desire of the American Federation of Labor any more than it is of anyone else. The principal recommendations were the following:

Maintenance of wages, which manifestly can not

be maintained if customers and consumers are unwilling to pay them.

Shortening of working hours. Defensible only if some classes of labor are determined to curtail developments, especially constructional, and residual work must be prorated.

Assurance of a minimum number of employees; which no employer can guarantee unless he be a clairvoyant.

Employers to take on additional workers; which no one will do unless the additional workers will produce goods that can be sold.

Work to be created through public building; which means taxing all the people to provide employment to some on the terms that they demand.

There was a reiteration of the generalization for stabilization in industry and advance planning of production. No advance planning of production is practicable if labor obstructs the law of supply and demand and produces conditions that strangle demand.

American labor declares that it wants work, not doles, and that sounds good; but when it adds that it wants work only on its own terms, that is not so good. We must bear in mind, however, that these words come out of the mouths of the labor leaders, who are professionally obliged to talk that way. Fortunately the great body of American workmen are sensible; and are discriminatory between facts and buncombe when honest explanations are offered to them.

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Alloy Steels for General Structural Uses

TAKING as his subject "Alloy Structural Steels," H. J. French, research metallurgist, International Nickel Co., New York, delivered an address before the first fall meeting of the New York chapter of the American Society for Steel Treating on Monday evening, Oct. 19. He emphasized in particular the role of nickel, chromium, manganese, molybdenum and vanadium in such steels, defining these as steels which are used in general engineering applications as distinguished from tool steels. The presentation was designed to give a brief résumé of certain facts not usually found in text books.

The speaker dealt with his subject under four general heads: Alloy steels as a tonnage proposition; the nature of such steels; reasons for their applications, and the two general classes—low and high alloy.

Discussing copper as used mainly in the atmospheric corrosion resisting class, the speaker confined his remarks to the other five alloying metals. These five elements can be divided into two classes: Those in which chromium, nickel and manganese predominate and those in which molybdenum and vanadium are important. The low alloy steels were described as those containing usually no more than 6 or 7 per cent of the alloying metal while the high alloy types run up to much larger percentages.

Discussing each element in turn Mr. French briefly pointed out the properties which they bestow on the alloy steels. Chromium tends to harden the product while nickel and manganese increase the toughness, among other things. Molybdenum bestows primarily greater depth hardening properties while vanadium both cleans the metal and increases the elastic limit.

It is, however, in combinations of those various alloying elements that the highest properties are obtained. For example, a nickel-chromium-molybdenum steel has unusual depth hardening qualities—to a greater degree than if any one of these three metals were left out. Large dies of this composition, 6 in. square, have a Brinell hardness of around 400, practically throughout the mass.

The alloy combinations cited by Mr. French included also the high manganese or Hadfield steel, the chromium-molybdenum steels for air-craft tubing with their high strength and air-hardening properties after welding, nickel boiler steels, nickel and other alloy steel locomotive frames, the heat resistant steels containing chromium and chromium and nickel, and the corrosion resistant or rustless steels of similar compositions.

Mr. French concluded his address with reference to the phenomena of dispersion hardening as applied to both the ferrous and the non-ferrous alloys and emphasized the importance of this new phase of submicroscopic alloy hardening by which high tensile and other properties are bestowed on metal products.

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Plant sales by the primary iron and steel industry in Canada during 1930 were valued at $52,588,935, according to the Dominion Bureau of Statistics, Canada. This value, representing actual sales receipts for pig iron, ferroalloys, steel ingots, direct steel castings and rolled iron and steel products, was 27 per cent below the corresponding figure for 1929 and 15 per cent below that of 1928, but exceeded the 1927 value by 15 per cent. In 1930, a total of 34 firms operated 49 different plants or departments, including blast furnaces, steel furnaces, ferroalloy plants and rolling mills. Capital employed by these concerns was reported at $112,079,926; the average number of employees was 9723, and salaries and wages totaled $14,934,325.

Customs Court Decision Affects Steel Angles

Steel angles, less than 3 in., are excluded from paragraph 312 of the Tariff Act of 1922, since they are not shown to be employed chiefly for structural purposes, according to a decision of the United States Customs Court, Second Division, in a suit instituted by the Judson Freight Forwarding Co. against the Government.

The decision of the court holds that they are properly classifiable under paragraph 304 as steel "not specially provided for." However, says the court, since the steel under question was valued at over 1c. but not over 1.50c. per lb., the correct applicable rate is 3/10 of 1c. per lb. and not 2/10 of 1c., as alleged by the plaintiff in this action. The court would not permit the classification of these angles as steel bars, notwithstanding testimony that steel companies in this country operate under a trade practice which generally classifies small shapes under 3 in. in the bar category.

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Bar Iron Wage Lower

The wage on bar iron has declined, and during the November-December period will be based on a 1.65c. card, according to an agreement reached between the Western Bar Iron Association and the Amalgamated Association of Iron, Steel and Tin Workers. The rate is based on the average selling price of bars in the September-October period.

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Shepard Niles Crane & Hoist Corpn., Montour Falls, N. Y., has removed its Chicago office from the People's Gas Building to 564 West Monroe Street. Walter B. Briggs is district manager, and associated with him is G. G. Robbins.

Contrary Trends Obscure Signs of Improvement in Some Lines

GAINS in Orders for Several Products Offset by Losses in Others—Ingot Production Up Slightly to 29 Per Cent

REPORTS from metal consuming industries are a trifle more encouraging this week, but there are contrary trends in the demands for various forms of steel. It is accordingly difficult to determine whether a uniformly upward movement in steel bookings and operations can be expected within the near future.

Moderate gains in orders for bars, sheets, wire products, tin plate, rails and track supplies are offset by declining requirements in structural steel, plates and pipe, with the net result slightly favorable for some mills and districts.

Steel plant operations have expanded a little at Pittsburgh, Youngstown and Birmingham, but are virtually stationary at Chicago, Cleveland and elsewhere. For the country as a whole, the ingot production rate may be measured at 29 per cent of capacity, compared with 28 per cent a week ago, the smallness of the gain reflecting the continued curb on buying.

The automobile industry, for example, has been going forward on its new production schedules more slowly than expected, and some steel orders looked for this month will not be placed until November. The farm implement industry is taking steel a little more freely for new manufacturing programs, but has not yet become an important factor in mill schedules. The slump in takings of structural steel for construction work is still pronounced.

RAILROADS, though placing some rail and track supply orders, are so plainly disappointed over the Interstate Commerce Commission's decision in the freight rate case that the extent of their fall purchases is in doubt. Meanwhile, the steel industry appraises the proposed freight rate increases as too small to aid the carriers materially or to stimulate buying by general consumers prior to the time that the rates become effective.

Orders for rails, much smaller in the aggregate than is usual at this time of year, include 43,000 tons for the Santa Fe, 15,000 tons for the Atlantic Coast Line, 6000 tons for the Delaware & Hudson, 4000 tons for the Northern Pacific and 2000 tons for the Western Maryland. In addition, the Santa Fe has ordered 12,000 tons of track supplies, and the Chesapeake & Ohio will buy 11,000 tons this week.

Rail mill schedules, however, have not been increased. A gain in tin plate mill activity is owing to anticipated rollings for later delivery. Pipe production, supported lately by work for oil and gas lines, is very low. The National Tube Co. has booked 5000 tons for the Stanolind Pipe Line Corpn. Two projects, one a line in the Pacific Northwest and the other from Chicago to Milwaukee, requiring much larger tonnages, may not be placed for some time.

MEANWHILE, some unsettlement has been caused by price declines of $1 a ton on hot-rolled strip and $2 on cold-rolled strip and fender stock, chiefly at Detroit, where pressure has also been brought to bear on automobile body sheet prices. Raw material prices are weak, with further declines of 50c. a ton on some grades of pig iron in the Valleys and at Pittsburgh and a like drop on foundry iron in eastern Pennsylvania. Pig iron business shows no marked expansion except at Chicago, where gains have been steady for a month.

WHILE the unprofitable nature of operations at current prices is shown in the third quarter statements of the United States Steel Corpn. and other producers, the heavy deficits may also be viewed in the light of the large allowances for depreciation, obsolescence and the like. Against three months' earnings of less than $9,000,000 for the leading interest, the writing off amounted to nearly $11,800,000, substantially the figure for each of the preceding quarters.

Exports of iron and steel in September, at 69,768 tons, were the lightest since May, 1908. Nine months' exports of 789,114 tons were 52 per cent below those of the same period last year. Imports in September of 30,966 tons were nearly 3 per cent above those of August, but off 23 per cent from September last year, while the nine months' import total declined 20½ per cent compared with 1930.

New low levels for pig iron and steel scrap are recorded in THE IRON AGE composite prices, pig iron having declined to $15, the lowest since October, 1915. Steel scrap, at $8.71, is below any quotation of which THE IRON AGE has record. Finished steel remains at 2.116c. a lb. for the fifteenth week.

Pittsburgh Steel Ingot Production Gains; Further Declines in Pig Iron Prices

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PITTSBURGH, Oct. 27.—Improved sentiment and new buying which have been noticeable in the steel trade for two or three weeks have finally resulted in a slight increase in steel output. Ingot production in the Pittsburgh district this week is estimated at 27 per cent, a gain of two points over the level which has prevailed for several weeks. Valley production has also recovered to some extent from the low level of last week, and is estimated at 25 per cent. A 40 per cent rate still prevails in the Wheeling district. One large producer in that territory was able to use up a substantial part of its raw steel accumulation without reducing its open-hearth production during the month. An independent producer in the Pittsburgh area now has half of its open-hearth capacity active, and the leading interest has stepped up production a little. Blast furnace operations are unchanged.

Local steel companies are still watching the automobile industry very closely for the first signs of a production gain. It is reported that two or three outstanding makers of small cars are almost ready to go into production on their new models and have placed substantial orders with body and parts makers. In some cases this business has been passed on to the steel companies in the form of releases, particularly on automobile body sheets. Otherwise specifications from the industry as a whole have not increased very much.

The other large outlets for finished steel are generally unchanged. Recent limited gains have held, but there has been no further improvement. Railroad buying is still scattered, and Pittsburgh district mills have not shared very heavily.

A local maker has taken an order for 5000 tons of 8-in. line pipe, but further business of this character is unlikely. Orders for fabricated structural steel are not so heavy, but shipments against old contracts are well maintained, and some of the larger interests have fair-sized backlogs for the winter months. Releases on tin plate are seasonally light, but some makers have begun production on anticipated tonnage, which has resulted in a slight gain in output.

Finished steel prices are holding in a general way, although quotations on cold-rolled strip steel have weakened, notably in the Detroit district, where

Steel ingot production in Pittsburgh area up two points to 27 per cent of capacity, first gain in weeks.

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Slightly more cheerful outlook in steel trade accompanied by further weakness in pig iron.

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Automobile industry slow in getting started on new schedules, but step-up is expected in November.

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Cold-rolled strip prices ease off, and automobile body sheets have been subject to pressure.

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No pronounced weakness in scrap market, but strengthening impulses are lacking.

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concessions of $1 and $2 a ton have become general. Automobile body sheets have also been subject to pressure, but no downward price revisions have been necessary. Some confusion has arisen over the extension of old contracts in a few cases.

Quotations on pig iron are lower at Valley and Pittsburgh district furnaces. Competition of Lake Erie furnaces is blamed for the revision.

PIG IRON

Unsettled conditions in the pig iron market at Pittsburgh and in the Valleys have led to a further downward revision in prices. A Valley maker is now quoting foundry iron at $16, furnace, and malleable and Bessemer at $16.50. The basic iron price is nominal at $15. Competition with Lake furnaces has been largely responsible for this reduction. The Pittsburgh district furnace is quoting foundry, malleable and Bessemer at $17, furnace, this representing a decline of 50c. a ton on the two latter grades. A local merchant interest recently began the production of silvery and Bessemer ferrosilicon iron, and is said to have produced material ranging from 7 to 17 per cent silicon. While no official announcement regarding the price has been made, the local producer will enjoy a freight rate advantage in this district of $3.56 a ton over Jackson County, Ohio, furnaces and $3.30 over the Buffalo producer. The market for silvery iron in this district has broadened somewhat in recent months. No change in the character of the pig iron business is reported, although shipments average somewhat ahead of those of September. A Valley merchant stack may be blown in during November.

CURRENT MARKET PRICES FOR STEEL, PIG IRON AND OLD MATERIAL WILL BE FOUND ON PAGES 1154 TO 1158, INCLUSIVE.

SEMI-FINISHED STEEL

No change has occurred in this very dull market, and prices on billets, slabs and sheet bars continue at $29, Pittsburgh or Youngstown. Occasional sales of forging billets are being made at $35, Pittsburgh. Wire rods are very dull, but the price is reported to be holding at $35, Pittsburgh or Cleveland.

RAILS AND TRACK SUPPLIES

The Chesapeake & Ohio has not yet closed against its recent inquiry for about 11,000 tons of track supplies. No other new business has come into this market. The Atlantic Coast Line has placed 15,000 tons of rails with the Carnegie Steel Co. and the Bethlehem Steel Co. This road is expected to buy accessories for that order. Rail business is rather slow otherwise, but the season for active buying is not far enough along to give any indication of the plans of the carriers.

BARS, PLATES AND SHAPES

With demand from manufacturing consumers unchanged at the recent low rate, the market on heavy hot-rolled products is still dependent largely upon structural steel and reinforcing bars for its principal outlets. While new inquiry for such material has fallen off to some extent, due to seasonal conditions, a few large projects are still coming out from time to time and work will continue during the winter on many large jobs let during recent months. This will enable structural mills to maintain a fair operation during the winter months, and little reduction from the present rate is in prospect. The same can hardly be said of reinforcing bars, as concrete work is affected more seriously by weather conditions. Demand for plates is very

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Oct.27, 1931	Oct.20, 1931	Sept.29, 1931	Oct.28, 1930
No. 2 fdy., Philadelphia	*$15.76*	$16.26	$16.26	$18.76
No. 2, Valley furnace	*16.00*	16.50	17.00	17.00
No. 2, Southern, Cincinnati	14.69	14.69	14.69	15.19
No. 2, Birmingham	12.00	12.00	12.00	14.00
No. 2 foundry, Chicago*	17.00	17.00	17.50	17.50
Basic, del'd eastern Pa.	16.75	16.75	16.75	17.75
Basic, Valley furnace	15.00	15.00	15.50	17.00
Valley Bessemer, del'd P'gh.	*18.26*	18.76	18.76	19.26
Malleable, Chicago*	17.00	17.00	17.50	17.50
Malleable, Valley	*16.50*	17.00	17.00	17.50
L. S. charcoal, Chicago	25.04	25.04	25.04	27.04
Ferromanganese, seab'd carlots	†85.00	†85.00	†85.00	94.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Ferromanganese quotations adjusted to carload unit; larger quantities at discount.

Rails, Billets, etc., Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	34.00	34.00	34.00	36.00
Rerolling billets, Pittsburgh	29.00	29.00	29.00	31.00
Sheet bars, Pittsburgh	29.00	29.00	29.00	31.00
Slabs, Pittsburgh	29.00	29.00	29.00	31.00
Forging billets, Pittsburgh	35.00	35.00	35.00	36.00
Wire rods, Pittsburgh	35.00	35.00	35.00	36.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.60	1.60	1.60	1.60

Finished Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.60	1.60	1.60	1.60
Bars, Chicago	1.70	1.70	1.70	1.70
Bars, Cleveland	1.65	1.65	1.65	1.65
Bars, New York	1.93	1.93	1.93	1.93
Tank plates, Pittsburgh	1.60	1.60	1.60	1.60
Tank plates, Chicago	1.70	1.70	1.70	1.70
Tank plates, New York	1.88	1.88	1.88	1.88
Structural shapes, Pittsburgh	1.60	1.60	1.60	1.60
Structural shapes, Chicago	1.70	1.70	1.70	1.70
Structural shapes, New York	1.85½	1.85½	1.85½	1.85½
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh	*1.50*	1.55	1.55	1.60
Cold-rolled strips, Pittsburgh	*2.05*	2.15	2.15	2.35

Finished Steel, *Per Lb. to Large Buyers:*	Oct.27, 1931 Cents	Oct.20, 1931 Cents	Sept.29, 1931 Cents	Oct.28, 1930 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.35
Hot-rolled annealed sheets, No. 24, Chicago dist. mill	2.50	2.50	2.50	2.45
Sheets, galv., No. 24, P'gh	2.90	2.90	2.90	2.95
Sheets, galv., No. 24, Chicago dist. mill	3.00	3.00	3.00	3.10
Hot-rolled sheets, No. 10, Pittsburgh	1.70	1.70	1.70	...
Hot-rolled sheets, No. 10, Chicago dist. mill	1.80	1.80	1.80	...
Wire nails, Pittsburgh	1.90	1.90	1.90	1.95
Wire nails, Chicago dist. mill	1.95	1.95	1.95	2.05
Plain wire, Pittsburgh	2.20	2.20	2.20	2.30
Plain wire, Chicago dist. mill	2.25	2.25	2.25	2.35
Barbed wire, galv., Pittsburgh	2.55	2.55	2.55	2.60
Barbed wire, galv., Chicago dist. mill	2.60	2.60	2.60	2.75
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$5.00	$5.00

Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	*$10.12½*	$10.25	$10.50	$14.25
Heavy melting steel, Phila.	8.00	8.00	8.50	11.50
Heavy melting steel, Chicago	8.00	8.00	8.00	11.00
Carwheels, Chicago	9.00	9.00	9.50	12.50
Carwheels, Philadelphia	12.00	12.00	12.00	15.00
No. 1 cast, Pittsburgh	10.00	10.00	10.00	12.75
No. 1 cast, Philadelphia	11.50	11.50	11.50	13.00
No. 1 cast, Ch'go (net ton)	8.50	8.50	8.50	10.00
No. 1 RR. wrot., Phila.	10.00	10.00	10.00	14.00
No. 1 RR. wrot., Ch'go (net)	6.50	6.50	7.00	9.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.40	$2.40	$2.40	$2.60
Foundry coke, prompt	3.50	3.50	3.50	3.50

Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	7.37½	7.37½	7.37½	9.62½
Electrolytic copper, refinery	6.75	6.75	6.75	9.25
Tin (Straits), New York	22.87½	23.00	22.37½	27.12½
Zinc, East St. Louis	3.25	3.30	3.65	3.95
Zinc, New York	3.60	3.65	4.00	4.30
Lead, St. Louis	3.62½	3.52½	4.22½	4.95
Lead, New York	3.75	3.75	4.40	5.10
Antimony (Asiatic), N. Y.	6.50	6.50	6.60	7.37½

On export business there are frequent variations from the above price. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

light, with railroad car buying almost entirely lacking in this territory. There is little movement of plates for tank work, and barge buying is still being postponed. However, the inquiry for 10 to 40 barges for the Mississippi River Barge Line Co. is again considered active by local builders. Movement of merchant and alloy steel bars to the automobile industry has failed to show any marked increase. Some inquiry is before the trade, but most of it does not call for early purchases.

WIRE PRODUCTS

Shipments this month have bettered the September average by as much as 10 per cent, with barbed wire and fencing for the merchant trade in the South and West as a principal factor. Manufacturers' wire continues exceedingly dull. Prices of nails are now rather steady at $1.90 a keg to jobbers and $2 to the trade. Manufacturers' wire is also well maintained at 2.20c., Pittsburgh.

TUBULAR GOODS

The Stanolind Pipe Line Co. has ordered 65 miles of 8-in. line pipe, about 5000 tons, from the National Tube Co. This is in addition to the 290 miles of 10 and 12-in. pipe placed by the Stanolind company with four makers early in September, and is for immediate shipment. While pipe makers are generally of the opinion that not much additional line pipe tonnage will be placed this year, some inquiry is before the trade which may yet be acted upon, although shipments would hardly be made until spring. One of the larger projects is a line from the gas fields of Wyoming and Montana to British Columbia, which would take a large tonnage. The Continental Construction Corpn. is also still figuring on the extension of its line into the Milwaukee district. Movement of standard pipe this month is just about equal to that of September, and has failed to show much of a seasonal pick-up. Oil country goods are also quiet, although there is a fairly steady call for drill pipe from the east Texas fields. Pipe mill operations in the industry as a whole are considerably lower than they were last month, and are estimated at little more than 20 per cent of capacity.

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SHEETS

Placing of sheet tonnage by the automobile companies has practically ceased, and specifications against material already on order have failed to develop. One or two of the body builders have been taking heavier tonnages of automobile body sheets, but these plants are said to be ahead of the automobile companies themselves in their work upon new models. Releases from the automotive group are now said to be postponed until November and steel makers are not so sanguine about that month's production schedules. While recent gains in demand from other sources have been maintained, no increases are reported. Production of sheets is holding at around 30 per cent of capacity, although sharp fluctuations from week to week are in evidence. Prices seem to be holding, although it is reported from Detroit that some of

THE IRON AGE COMPOSITE PRICES

	Finished Steel	Pig Iron	Steel Scrap
Oct. 27, 1931	2.116c. a Lb.	$15.00 a Gross Ton	$8.71 a Gross Ton
One week ago	2.116c.	15.17	8.75
One month ago	2.116c.	15.42	9.00
One year ago	2.135c.	16.29	12.25
	Based on steel bars, beams, tank plates, wire, rails, black pipe and sheets. These products make 87 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1931	2.142c., Jan. 13	2.102c., June 2	$15.90, Jan. 6	$15.00, Oct. 27	$11.33, Jan. 6	$8.71, Oct. 27
1930	2.362c., Jan. 7	2.121c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.412c., April 2	2.362c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.391c., Dec. 11	2.314c., Jan. 3	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.453c., Jan. 4	2.293c., Oct. 25	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22
1926	2.453c., Jan. 5	2.403c., May 18	21.54, Jan. 5	19.46, July 13	17.25, Jan. 5	14.00, June 1
1925	2.560c., Jan. 6	2.396c., Aug. 18	22.50, Jan. 13	18.96, July 7	20.83, Jan. 13	15.08, May 5

the larger buyers still have tonnage coming to them booked earlier in the year at lower prices and are seeking extensions of such contracts. With buying again dormant in that district, a definite gage on the price structure is rather difficult.

TIN PLATE

Tin plate production has risen slightly in the last week because two or three large makers have begun work on anticipated tonnage. The schedule of one large company calls for considerably more work of this kind in November and production may be expected to rise further as a result. The industry as a whole is now operating at better than 45 per cent of capacity. Contracting for 1932 is rather slow, although some of the larger buyers have been covered. The delay is partly attributable to the fact that carryovers in pack cannot yet be definitely gaged.

STRIP STEEL

Specifications have failed to show much improvement in the last week, but releases in the month as a whole are running about 10 per cent ahead of September's. New buying has also been heavier, but mill operations have not risen much over the minimum levels reached about a month ago. Schedules vary sharply from week to week, and one maker of hot-rolled strip has closed its plant indefinitely because of the light demand and low prices. Reports of shaded prices on cold-rolled strip in the Detroit territory persist, but the market in other centers is still well maintained at 2.15c., Pittsburgh. Concessions on hot-rolled material are less frequent.

COKE AND COAL

The only activity in the market is in heating coke, and the movement of this commodity is still slow for this season of the year. No inquiry for furnace coke is before the trade, and the market is still nominal at $2.40, Connellsville. Foundry coke shipments are a little heavier than they were during September. Domestic coal is more active, but the railroads and large consuming industries have not increased their requirements. Slack prices are still demoralized.

OLD MATERIAL

Scrap continues to be weak, and with only minimum purchases by mills on which to base quotations, a fair appraisal of the market is difficult. While one consumer has been able to buy a small tonnage of heavy melting steel at $10, dealers are having difficulty in making purchases under this level, and are still trying to get at least $10.25 on sales to other buyers. Under the circumstances, the range of the market is very narrow. Quotations made recently have brought the price of heavy melting steel down to the low level reached during the summer, which was the minimum price of the present century. No changes are reported in the other grades, and sales into consumption are at a minimum. In some cases distress lots have been disposed of at prices under the generally recognized market. Foundries are doing little buying. Shipments of open-hearth grades are restricted at some consuming points. The monthly list of the Pennsylvania Railroad, on which bids are to be opened on Nov. 4, contains 19,600 tons of scrap, including 3000 tons of No. 1 heavy melting steel.

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Cincinnati District Pig Iron Sales in October Gain Over Those of September

CINCINNATI, Oct. 27.—Purchases by one or two important pig iron consumers during October in anticipation of their fourth quarter and early 1932 requirements brought the level of business for the month ahead of that of September. Sales last week receded to less than 1000 tons, all in small lots for immediate delivery. Inquiry has almost vanished. Uncertain prices on Northern iron continue to be contrasted with the steadiness of Southern quotations.

COKE

Movement of foundry grades of coke shows little change. The price of by-product foundry coke will continue at $9, delivered in Cincinnati, during November.

WAREHOUSE BUSINESS

Prices on nails have been changed, making the new quotation on 10 to 49 kegs $2.65 and on larger quantities $2.50.

FINISHED STEEL

Demand for sheets has settled to slightly less than 40 per cent of capacity output. Orders in the last four weeks have shown virtually no fluctuation from this level. Except for the railroads, all sheet consuming fields are represented in current business. Fall weather has brought a slight decrease in road construction demand, but this was offset by a slight improvement of automotive demand.

OLD MATERIAL

Except for a small movement of sheet clippings and blast furnace scrap on old contracts, there is relatively no activity in scrap.

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Rates on scrap iron and steel to Kansas City, Mo., and Kansas City, Kan., from points in the Southwest and from certain points in Missouri were held to be not unreasonable by the Interstate Commerce Commission.

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Chicago Steel Demands Gaining in Some Directions, Losing in Others

CHICAGO, Oct. 27.—Evidence for and against market improvement is difficult to weigh. Some rolled steel products, such as bars, are unquestionably moving in larger quantities. Shape shipments are on an even keel, but plates moving to consumers are in lighter volume than earlier in the month.

On the other hand, pig iron shipments have continued to grow for almost four weeks, and shipping instructions point to still further improvement in the coming month. New sales are almost double the volume of September, and sellers still have fair inquiries on which to work.

Steel mill output remains close to 25 per cent of capacity. Some units are making fewer ingots, but one producer which dropped below 20 per cent of capacity about 10 days ago is now back in line, so that losses now seem to be offset by gains. Wire production is outstanding in that it now ranges between 30 and 35 per cent of capacity.

Probably as encouraging a feature as any in the market at this time is a firmer tone in prices and a greater determination to hold present levels. However, buying has been on such a low scale that it is difficult to picture what might occur should attractive tonnages suddenly make their appearance.

Bids are again being taken on Illinois work which was held back during the wage law controversy. It seems probable that bridge and building work will go forward during the winter months and, though road contracts will be closed, no further laying of pavement will be undertaken until early next spring. The Federal Government is in the market for 5000 tons of bars for work along the Mississippi River at Rock Island, Ill.

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Gains in orders for bars and wire products offset by losses in orders for some other forms of steel.

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Ingot production for district unchanged at about 25 per cent of capacity.

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Pig iron shipments have grown steadily for four weeks, with further expansion indicated.

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Scrap market dull and weak.

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PIG IRON

October shipments of Northern foundry iron continue to grow, and specifications for delivery in the coming month point to a still higher November movement. October shipments are about 40 per cent heavier than in September, part of this gain representing greater activity at malleable foundries, which are receiving releases on automotive and railroad contracts. In view of general conditions, inquiries and orders are considered satisfactory. The silvery market continues affected by supplies still available on Chicago docks. Southern iron continues steady at $11, Birmingham, with only small tonnages moving into this market. Sales of charcoal iron are slightly larger, and the melt shows signs of expanding.

FERROALLOYS

Shipments continue to gain slowly, and tonnage moved in October will be the largest in six or seven months. A small tonnage of spiegeleisen is available on Chicago docks. Users have been expecting European ferroalloys to arrive, but the difficulty of accumulating enough orders for a cargo offsets price advantages, and dealers are not inclined to take large tonnages on consignment.

COKE

The movement of by-product foundry coke is growing slowly. Prices are steady at $7.50 a ton, local ovens.

BOLTS, NUTS AND RIVETS

Demand shows little change, and prices are still subject to some variation. More releases on contracts are expected from railroad shops, and the farm implement manufacturers are counted on to take larger quantities. Stocks in producers' hands are well rounded.

BARS

Demand for mild steel bars, though still spotty, is somewhat heavier, and on the whole bar mill units are operating on more satisfactory schedules than are other steel mill departments. Several units that had been operating intermittently, a week off and a week on, are now entering the third week of continuous output. Backlogs are very light, as new buying remains on the immediate requirement basis. Competition from mills outside of the Chicago district is extremely keen. The iron bar market is dull, though there is betterment in sight as Western railroads start to call workers to shops. Probably the most marked betterment in the market is in alloy steel bars. Railroad shop needs are growing slowly and farm implement manufacturers are taking larger quantities, not only for immediate requirements, but they are anticipating needs for heavier production schedules that are planned for the first week in November. A change is also noted in the rail steel bar market, as it is affected by demand from the manufacturing trade. New orders in carlot size are more numerous, and in some cases prompt truck delivery is expected on a few tons. Bed manufacturers are pressing particularly hard. Rail steel bar production averages about 40 per cent of capacity.

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CAST IRON PIPE

This commodity in the 6-in. and larger sizes is moving at $34 and less a ton, Birmingham, as foundries try harder for some of the small work that is up for figures. Public work is slowing down perceptibly. In the North, the approach of cold weather is a factor, but in other directions there seems to be trouble in marketing bonds. There is still some private work before cast pipe sellers, but almost without exception the tonnages sought are only a few carloads.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $42 to $44; 4-in., $45 to $47; Class A and gas pipe, $3 extra.

RAILS AND TRACK SUPPLIES

The Santa Fe has placed 12,000 tons of track supplies, which were distributed in like proportion to the rails. Of the rail tonnage, Colorado Fuel & Iron Co. was awarded 32,000 tons and Inland Steel Co. and Illinois Steel Co. each 5500 tons. There are no releases as yet against these orders, though in some past years this railroad has taken out part of its contract before the new year. A railroad operating northwest from Chicago is in the market for a small tonnage of rails. Production of rails remains highly variable and at a low rate on the average. The Chicago & Illinois Midland has submitted to the Interstate Commerce Commission plans for a through rail-

road from Peoria, Ill., to St. Louis. What this will mean in rail tonnage is not yet known. Reports that the Illinois Central will soon buy rails appear to be without foundation.

The Northern Pacific has ordered 2400 tons of rails from the Steel Corporation and 1600 tons from Bethlehem.

REINFORCING BARS

Although both inquiries and awards remain extremely light, there is an encouraging note in the prospect that several large apartment buildings will be built. This is one phase of the reinforcing bar market which has been extremely dull. The Supreme Court of Illinois has held invalid the prevailing rate of wage scale law and once again State departments are busily engaged in taking figures. No doubt much institutional building work will go forward this winter, but a good deal of road work may be delayed until spring. The price situation is unchanged. There is growing dissatisfaction among dealers with the low level of quotations and efforts may be made to advance prices out of warehouses.

SHEETS

Output is still to be measured between 20 and 25 per cent of capacity, though it is probably nearer the lower figure than a week ago. Purchases are on the basis of small lots, for which prices are holding. It has been some time since a real test of this market has been made. The roofing trade is passing through a very dull season, and shelving and locker manufacturers have really not made a good start this fall. Container manufacturers have had fair schedules since late summer, but recent sheet releases indicate that consumption by them is lighter.

Base prices per lb., deliv'd from mill in Chicago: No. 24 hot-rolled annealed, 2.55c.; No. 24 galv., 3.05c.; No. 10 hot-rolled, 1.85c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

WIRE PRODUCTS

Production, after having leveled off for several weeks, has again gained ground and now stands in the range from 30 to 35 per cent of capacity. This gain is somewhat general, though it applies more especially to some rural districts, such as in the Southwest, where improvement in business is distinctly encouraging. Incoming tonnages are not of the size that would afford a real test of the market, but on such orders as are being taken quotations are steady, and some producers are beginning to talk about efforts to obtain higher prices. Shipments of copper wire from Belgium are troublesome in the American market, and a move for a higher tariff may be expected.

STRUCTURAL MATERIAL

Both inquiries and awards are touching close to the low point of the year. Previous to this there have been times when new contracts were sluggish, but at the present time not only does this situation prevail, but lack of inquiries affords little hope for recovery in the near future.

PLATES

Use of this commodity continues to decline. Pipe mills are all but inactive and calls for plates for use in oil production parts of the country are at low ebb. The Burlington, which had expected to come into the market for four locomotives, now finds its plans very indefinite.

OLD MATERIAL

A cargo of cast iron borings will leave Chicago in about a week for Lake Erie. This will close about the only large outlet for this grade, and most sellers expect prices to drop at least 50c. a ton. A steel mill, which had cut off shipments of heavy melting steel for about two weeks, has again opened the gates, though the in movement is still somewhat restricted. Dealers have been quick to use the freight rate ruling as an argument to press sales. However, buyers are not convinced that they will have to pay the advance, believing there is a possibility the advance will be absorbed by the seller. Producers are increasing resistance to present price levels. In some cases new bin capacity is being added with the hope that accumulations can be sold later at higher prices. The Burlington, which recently put out a list and then withdrew it, is again offering it for sale.

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St. Louis Pig Iron Prices Firm; Demand for Steel Products Small

ST. LOUIS, Oct. 27.—Although Northern pig iron is quoted at $17, f.o.b. Chicago, the St. Louis Gas & Coke Corpn. has made no reduction in its quoted price of $17.50, f.o.b. Granite City, the belief being expressed that no additional tonnage would be created by a cut in price. Melters, it is said, are not complaining as to present prices, but are not buying because of a lack of orders for their finished products. Southern iron continues firm at $11, f.o.b. Birmingham, efforts to break the market having proved futile. Stove manufacturers have curtailed operations considerably, awaiting cold weather to move the merchandise from the hands of retailers before producing more. The melt of basic iron in the district shows no improvement over the recent estimate of operations at 17 per cent of capacity.

FINISHED STEEL

The market for plates, shapes and bars continues slow, buyers now giving the excuse that they will await the taking of inventories before coming into the market for material.

The Illinois Highway Commission has advertised for bids to be opened Nov. 2 for 71 road, bridge and grading projects, representing contracts to be relet for work stopped when the prevailing wage contract was invalidated by the Supreme Court. This includes the following structural steel bridge projects: Cook County, 4091 tons; Fulton County, 156 tons; Sangamon County, 595 and 362 tons, and Alexandria County, 172 tons. Reinforcing bar projects will total several thousand tons.

The contract for manufacturing the 1932 automobile and truck license plates for Missouri has been awarded to S. G. Adams Co., St. Louis, and will require 300 tons of No. 26 gage sheets.

The Laclede Steel Co. has been awarded the contract for 2500 tons of reinforcing bars for the Mill Creek sewer job at Louisville, Ky. Business with structural steel fabricators is extremely dull.

OLD MATERIAL

The Chicago, Burlington & Quincy Railroad, which withdrew a list of 8180 tons of scrap last week, has resubmitted the list this week, with 1380 tons additional. The Missouri Pacific withdrew a special list during the week on account of the low prices prevailing for scrap. For the same reason, other offers are light, as follows: Union Pacific System, 2600 tons; Chicago, Milwaukee, St. Paul & Pacific, 450 tons; New York, Chicago & St. Louis, 25 carloads, and Mobile & Ohio, 15 carloads. Neither dealers nor mills are buying much material. With the exception of stove plate, which is 50c. lower, prices are nominally unchanged.

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American Manganese Steel Co., Inc., Chicago Heights, Ill., has moved its Chicago office from 333 North Michigan Avenue to the branch office of the parent company, American Brake Shoe & Foundry Co., Room 1414 McCormick Building, 332 South Michigan Avenue.

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American Sheet & Tin Plate Co., Pittsburgh, is completing plant additions and betterments at its National works, Monessen, Pa., which have been under way for several months. Improvements have included the rebuilding of the tin house and a number of other minor changes.

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Cleveland Mills See Gain in Automobile Orders Next Month

Business the Past Week Has Hardly Held Up to Recent Volume—Weakness Appears in Strip Steel

CLEVELAND, Oct. 27.—The impetus gained in the local steel market earlier in the month made no further headway the past week. While some mills report a slight gain in orders, business with others hardly held up to recent volume. The aggregate for October will show a moderate gain over September.

A more optimistic feeling prevails, with the principal basis for this the prospect of a heavier demand from the motor car industry in November than during the present month. The recent spurt of buying by this industry has subsided, but renewed activity is looked for within the next week or two.

Outlook for an early improvement in the demand for steel from industries outside the motor car field is not very promising.

Orders for the 10,000 to 11,000 tons of track fastenings for the Chesapeake & Ohio Railroad are expected to be placed Oct. 28, and probably will be divided among several producers. No other inquiries from railroads are pending.

Activity in the construction field is limited to public work. With the opening of bids for the Cleveland underground exhibit hall and garage Oct. 29, steel in structural shapes and reinforcing bars required for local municipal jobs awaiting the award of contracts aggregates 13,000 tons. The State of Ohio will receive bids Nov. 6 for several highway bridges. Plans are expected to be out early in the coming year for the Cleveland Post Office, requiring a large tonnage.

While most prices are being well maintained, pressure has resulted in a concession of $1 a ton on hot-rolled strip in the Cleveland and Detroit territory to 1.50c., Pittsburgh, for wide and 1.60c. for narrow. Although there are continued reports of weakness on cold-rolled strip in the Detroit territory, the 2.15c. price appears to be maintained in this district on the small-lot orders that are being placed. Billet steel reinforcing bars are $1 a ton lower.

PIG IRON

Demand continues very dull. Shipments in October will aggregate about the same as during September. It was expected that the movement this month would show an increase owing to a heavier demand from the motor car industry, but these expectations are not being realized. However, a better demand from this source is looked for in November. Another Lake furnace may be banked, provided sufficient demand develops for domestic coke to permit the furnace to sell its coke output that is now used in its blast furnace. Prices are steady but untested in this territory. However, concessions from the $16 Lake furnace price on foundry iron are still being made to move iron to other districts. Lake furnace quotations on foundry and malleable iron range from $16 to $17. The latter price prevails for Cleveland delivery.

IRON ORE

Some of the shippers have lined up their last cargoes, and very little Lake Superior ore will be shipped in November. It is expected that the shipping season will close about Nov. 10, or nearly a month earlier than usual.

BOLTS, NUTS AND RIVETS

New demand from the motor car industry is giving the bolt and nut market some life. The Chevrolet Motor Co. is closing on a round tonnage, and several of the other motor car manufacturers have inquiries out. Demand from other sources continues very dull. Prices continue irregular. While the 73 and 10 per cent discount is being well maintained in some districts, weakness in other sections is bringing out an additional 10 per cent. Rivets continue very dull. Prices appear to be stabilized by the recent reduction.

SHEETS

The recent moderate improvement in the demand from the motor car industry is being maintained, but orders from other sources are light. While stamping plants have submitted quotations on a large number of inquiries from automobile manufacturers for car parts, little of this business has been placed. The local Fisher Body plant is about to start work on Chevrolet bodies for which it has taken a small quantity of sheets. This company is expected to come in the market in a few days for a tonnage sufficiently large to put the plant on a good production basis. Prices are firm.

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BARS, PLATES AND SHAPES

Demand for steel bars is slack, although orders show a slight gain. Alloy steel bars are moving somewhat better than recently. Inquiry for structural shapes has increased somewhat. Plates are very dull. Steel bars are firm at 1.65c., Cleveland, for delivery locally and in the immediate territory. For shipment to competitive points, concessions are being made to equalize the price with quotations of Pittsburgh and Chicago district mills. Billet steel reinforcing bars are now quoted at 1.50c., Cleveland, for desirable orders, or a reduction of $1 a ton. Plates and shapes are steady at 1.60c., Pittsburgh.

NAILS AND WIRE

Demand for nails has declined. Jobbers still have good stocks that were ordered against third quarter contracts carrying lower than the present $1.90 per keg price.

STRIP STEEL

While the demand is better than that of a few weeks ago, the improvement is only slight. Little business is coming from the manufacturers of automobile parts, although a gain from that source is expected. Weakness has appeared on hot-rolled strip, concessions of $1 a ton being made in some cases. While shading to 2c. is reported in Detroit on cold-rolled strip, the 2.15c. price appears to be holding here, although this has not been tested on round lot business.

OLD MATERIAL

Prices on some steel-making grades are at least 50c. a ton lower because of the continued absence of a local demand. However, when a Cleveland mill releases shipping orders the recently quoted prices, lately nominal and based on contract tonnage, are expected to be restored. A local mill that has been taking a limited tonnage of blast furnace scrap has shut off on shipments. Drop forge flashings are bringing $6, Cleveland, for shipment to Pittsburgh, where they are moving in small lots. The proposed $6 a car freight advance (maximum) on scrap will particularly affect bulky material, such as turnings and No. 2 bushelings, as carlots of these grades range from 20 to 25 tons.

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A project to develop standard specifications for sieves for testing purposes has been approved by the standards council of the American Standards Association. The American Society for Testing Materials and the United States Bureau of Standards are sponsors. Specifications developed by the A.S.T.M. in cooperation with the Bureau of Standards in 1926 will be used as a basis for the work.

Pig Iron Inquiries Are More Numerous in New York District

Melters Generally Inquiring for Small Lots, But Interest in First Quarter Is Keener—Steel Trade Dull

NEW YORK, Oct. 27.—Inquiries for small lots of pig iron are more numerous. Two consumers are in the market for 200 tons each, and one melter is negotiating for 300 to 500 tons. The Worthington Pump & Machinery Corpn. is seeking quotations on a small lot for its Holyoke, Mass., plant, and New Jersey Zinc Co. is inquiring for 100 tons for its Palmerton, Pa., works.

Sales for the week aggregated about 3500 tons, compared with a similar total the previous week and 2500 tons two weeks ago. Although present interest is chiefly in covering for early requirements, sellers report that foundries are now inclined to discuss forward delivery. A fair amount of business has been placed for first-quarter shipment.

Prices are highly competitive, with furnaces in the Buffalo district showing disposition to meet low delivered prices recently prevailing on eastern Pennsylvania iron.

REINFORCING BARS

Prices are unchanged at 1.60c., Pittsburgh, or 1.93c., delivered New York. New inquiries include 2000 tons of bars for the Albany-Rensselaer bridge over the Hudson River, on which bids will be opened Nov. 10. A high school building in Yonkers, N. Y., will require about 225 tons, and a garage for the city of Newark, N. J., will take 150 tons.

CAST IRON PIPE

The only fresh inquiry for pressure pipe reported in the past week is for 200 tons of 18-in. for Yonkers, N. Y. Featuring the awards is that of 1600 tons for the Latham, N. Y. Water District project, 800 tons of 6 to 10-in. for the Vernoi section, being placed with Warren Foundry & Pipe Corpn., and a like amount of 6 to 12-in. for the West Albany section with United States Pipe & Foundry Co. Award of 600 tons of sizes up to 30-in. for Washington was made to Lynchburg Foundry Co. Prices are highly competitive, with concessions of $2 to $3 a ton having been made on sizable tonnages.

Prices per net ton delivered New York: Water pipe, 6-in. and larger, $32.90; 4-in. and 5-in., $35.90; 3-in., $42.90. Class A and gas pipe, $3 extra.

FINISHED STEEL

Developments in the steel situation in this district have been unimportant and have, in fact, been closely following the pattern of recent weeks. Orders are chiefly for small lots and in such transactions there is little question as to price. Occasional concessions of $1 a ton have been granted on steel plates for the more desirable lots available.

OLD MATERIAL

Recent sales of scrap show an irregular price situation, with certain dealers obtaining slightly better prices for specialties, and others selling at still lower prices. Railroad wrought scrap, which had previously sold at a minimum of $10 a ton, delivered, has been reduced on a sale this week to $8, delivered. Based on sales of steel car axles, dealers are offering as little as $11, New York. No. 1 heavy melting steel is being bought at $8, delivered Coatesville, Pa., and a small tonnage is being shipped to Florence, N. J., at the same price. The dealer loading barges in New York harbor, at $6.25 a ton on barge for No. 1 steel, is completing the last cargoes for shipment to Buffalo by canal, as navigation closes shortly. This seller is understood to have a fair-sized contract, however, for barge shipment to a consumer in Bridgeport, Conn., and will continue loading barges for some weeks to fill this contract.

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Canadian Operations at Lowest Point in Years with No Improvement in Sight

TORONTO, Oct. 27.—While increased programs of expenditure by the various governing organizations of Canada and increased purchases by the mining interests have slightly stimulated business in some branches of the Canadian iron and steel industry, operations as a whole are at their lowest point in years. The mills have been hit rather hard by the general business depression and, while they have been able to keep in operation on hand-to-mouth orders, there is not sufficient new business in sight to keep them running much longer. Further curtailment in operations is looked for. Companies making rolling stock, carwheels, castings, etc., also are affected by lack of new railroad orders. Restricted building operations has resulted in short-time operations for radiator and sanitary ware plants. Agricultural implement makers are on a schedule of less than 20 per cent. Structural steel plants, however, are fairly active on bridge orders, and there is a fair flow of orders for equipment for power plants and mining development work.

PIG IRON

New business appears to be marking time. Melters are not showing much interest, and are placing small orders for iron only when their supplies run out. Pipe foundries are busy and are supplying the bulk of demand. Pig iron production continues to make new low records, with no indication of early improvement. Iron prices are unchanged.

OLD MATERIAL

This market is now in a state bordering on stagnation. Only a small tonnage of steel scrap business was booked. Practically no shipments are being made to the Hamilton district by local dealers. Dealers are out of the market and report no change in buying prices.

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Corrigan, McKinney Steel Co., Cleveland, has been awarded first place in a safety contest conducted by the National Safety Council in which steel mills participated during the six months ending June 30. The company reported lost-time accidents at a frequency of 1.545 per million man-hours. The rate of the nearest competitor was 1.601.

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Driver-Harris Co., Harrison, N. J., manufacturer of special alloys, reporting no lost-time accident with approximately 500,000 man-hours worked, was awarded first prize among the metal working group at the twentieth annual safety congress of the National Safety Council held recently in Chicago.

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Orders were placed in September for 132 electric hoists as against 203 in August, according to reports made to the Bureau of the Census by 13 leading manufacturers. Orders in the first nine months of 1931 totaled 2117 units, compared with 3273 in the corresponding period of last year.

Eastern Pennsylvania Pig Iron Weak; Rail Buying More Active

Foundry Grades of Iron Sold at $15, Furnace, for the Larger Lots —A Few Carriers Place Rail Orders

PHILADELPHIA, Oct. 27.—Steel inquiry continues larger than in previous months, but much of this prospective business is slow to materialize. In certain instances the material is for projects long postponed because of business conditions and not yet likely to go ahead without any further delay. Steel pipe business continues good, with most of the buying by contractors for foundation and other underpinning work. Plate and shape business is small, and on occasional purchases of a medium-sized tonnage concessions are not unusual. Prospective increases in operations in the automotive industry are reflected in plants here, which are beginning to expand their production schedules.

Construction projects are small, but in the aggregate represent a fair tonnage of steel. Included in building contracts are an employees building at the State Hospital in Norristown, Pa., and two small buildings at the State institution at Holmesburg, Pa. More than 3500 tons of 12 to 20-in. steel pipe is required for shoring and foundations in the boulevard along the Schuylkill River and approaches to the University Avenue bridge. Of this, about 2700 tons has been placed by the contractor with a jobber for direct shipment from the mill. About 850 tons is still to be awarded by two more contractors. The locomotive builder in this district is quoting on six locomotives for China and on 15 to 20 for the Lehigh Valley Railroad.

Business in rails and track accessories has been a little more active. The Atlantic Coast Line has divided 15,000 tons of rails between the Bethlehem Steel Co. and the Tennessee company; the Delaware & Hudson has placed 6000 tons of rails with Bethlehem, and the Western Maryland has divided an order for 2000 tons between Bethlehem and the Carnegie Steel Co. The latter road also awarded 38,000 tie plates to the Jones & Laughlin Steel Corpn. and 14,000 to the Wheeling Steel Corpn.

PIG IRON

The eastern Pennsylvania foundry pig iron market is somewhat weaker, in that sellers are now quoting $15, furnace, on the larger lots, and even this figure has been shaded in a few instances. Most of the foundry iron buying, however, is in small lots, on which the furnaces are often able to obtain higher figures, up to $16 a ton, depending on the destination of the iron and the competition. Large stocks of pig iron in furnace yards have brought about this weaker situation. One furnace has been an aggressive seller in New England, where eastern Pennsylvania iron has not been an outstanding factor in recent years. An inquiry for low phosphorus iron has been received by Eastern sellers from the American Steel Foundries, Chicago, but as 6000 tons of this grade is in stock at Port Colborne, Ont., and another large stock is available at an Ohio furnace it is doubted that the business will come to the East.

STEEL BARS

A boulevard along the Schuylkill River will require about 630 tons of reinforcing bars, of which 480 tons will be bought by the Frederick Snare Corpn. and 150 tons by Canuso & Sons. Recent awards of bars include 150 tons for foundations of the Benjamin Franklin Institute to the Taylor-Davis Co. The Williams Steel Co., Philadelphia, general contractor for the Van Sciver Co. building in Trenton, N. J., will buy 200 tons of bars. Merchant bar prices are unchanged at 1.60c., Pittsburgh, or 1.89c., Philadelphia. Billet steel reinforcing bars are 1.60c., Pittsburgh, or 1.89c., Philadelphia, with concessions of $1 and $2 a ton for desirable tonnages.

SHAPES AND PLATES

Minor projects are bringing an increased volume of inquiry from the smaller fabricating shops and boiler and tank builders. One inquiry for plates calls for about 400 tons and another specifies 100 tons, half for prompt shipment and the remainder for delivery next year. Prices are subject to occasional concessions of $1 a ton, from 1.70c., Coatesville, or 1.80½c., Philadelphia, in the case of plates and $1 to $2, from 1.70c. a lb., f.o.b. mill, or 1.76c., Philadelphia, on shapes.

SHEETS

Automobile body builders, including the Edward G. Budd Mfg. Co., are increasing operating schedules, but other sheet consumers are still at low operating rates. Radio manufacturers continue fairly active, but have not increased their operating schedules from recent weeks. Prices are being maintained, with buying still limited to small lots.

IMPORTS

In the week ended Oct. 24, 4549 tons of chrome ore arrived at this port, of which 4000 tons was from Portuguese Africa and 549 tons from British South Africa. Other imports were 333 tons of pig iron from British India and 246 tons of structural shapes from Germany.

OLD MATERIAL

All grades of scrap are inactive and prices are unchanged. The only movement is in deliveries on contracts and occasional transactions in distress carloads of special grades.

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Buffalo Steel-Making Operations Drop to a New Low Point This Week

BUFFALO, Oct. 27.—Inquiry for and sales of pig iron are about the same as in the previous week. It is reported that a Bridgeport concern may purchase an additional 1000 tons of foundry iron. District foundries are operating at not over 25 to 30 per cent, but appear to be more optimistic over future business than they have been for some time. A little more interest is apparent in barge canal movement as the season draws to a close.

FINISHED STEEL

The Lackawanna plant of Bethlehem Steel Co. has further reduced operations from 10 open-hearths, which were running last week, to eight this week. This is the week for Republic operation to be curtailed, under its alternate week schedule, and, as Wickwire Spencer is operating only two open-hearths, this week will go down as one of the lowest in operation this district has ever experienced.

Bids are to be taken in November on 3000 tons of steel for the new Austin street grade crossing elimination. A contract was placed by the Syracuse Lighting Co. for 500 tons of reinforcing bars involved in erection of a new building.

OLD MATERIAL

The high light of the week was the purchase by the leading consumer in this territory of 4000 to 5000 tons of No. 1 heavy melting and No. 2 heavy melting steel at $9 and $7.50 respectively. It is stated that most of the material sold was No. 1 steel. There have been some scattered sales of No. 1 machinery cast at $10.50. Stove plate is scarce and offers are being made at $8.50, with very little material being obtained. Some sales of machine shop turnings were made at $6.50, Niagara Frontier point, a slightly better price than on the last transaction.

CURRENT MARKET PRICES FOR STEEL, PIG IRON AND OLD MATERIAL WILL BE FOUND ON PAGES 1154 TO 1158, INCLUSIVE.

Birmingham Steel Outlook Better But Pig Iron Is Extremely Dull

District Has Ten Open-Hearths in Operation This Week, a Gain of Two—Six Blast Furnaces Active

BIRMINGHAM, Oct. 27.—The pig iron market continues passive, with very little interest, few inquiries and a minimum amount of buying. Melters still do not show any signs of changing from hand-to-mouth buying. Shipments fluctuate from day to day, and it is now apparent that the total movement for October will hardly equal that of September. The total of at least one company will be rather close to the low point of 1921. Reduced furnace operations of the past six weeks have slowed up yard accumulations. The price of $12 for No. 2 foundry in the Southern market is being strictly maintained. Furnace operations remain at six active stacks, five on foundry and one on basic.

CAST IRON PIPE

New tonnage last week was only of routine nature and in small lots, mostly carloads. American Cast Iron Pipe is expecting to get 1400 tons from Denver, on which it was low bidder, as reported last week. There are further indications of winter tonnage from Northern points. Plant operations are unchanged from 30 to 35 per cent. Quotations on routine business are still $35 to $36, base.

FINISHED STEEL

The outlook during the past two or three weeks has grown slowly but steadily better. Inquiries are not only more numerous, but for larger quantities. There has been some increase in actual tonnage booked, but this is only moderate. Structural steel and reinforcing bar fabricators last week had very little new tonnage. Prospects for the remainder of the year are more or less meager for the plants in this district. There was to be a fair tonnage available in Louisiana through the winter, but this has been tied up by political and bond situations, with attendant uncertainties. Some lines of wire products have been active, due to seasonal demands, but on the whole fourth quarter tonnage is slow in materializing. Open-hearth operations have been increased to 10 furnaces, a gain of two. The Tennessee company went to six on last Thursday and will operate on that schedule all this week. Gulf States Steel now has four in use, but one of these will go out shortly.

OLD MATERIAL

No change is reported from last week. Shipping instructions are slow, and inquiry is at a minimum.

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New England Pig Iron and Scrap Markets Quiet; Reinforcing Bars Are Firmer

BOSTON, Oct. 27.—Pig iron sales in the past week fell to less than 1000 tons. The H. B. Smith Co., Westfield, Mass., which normally buys several thousand tons at a time, bought 800 tons of low silicon iron, largely Mystic. The Smith company is now having most of its radiator castings made outside New England. Buffalo iron users are well covered for the remainder of 1931. The Mystic Iron Works reports a slight improvement in shipping instructions. The brightest spot in the foundry industry is a Massachusetts stove plant, which has run on full-time schedule for nine weeks.

REINFORCING STEEL

Recent lettings have been in small tonnages. Prices on billet bars are firmer and more in line with the 1.60c. mill quotation. The local market on car lots of bars is now generally 2.15c. a lb., base. In less than car lots, one to five tons are now 2.75c. a lb., base, Boston, and larger quantities, 2.30c. Rail steel bars are firmer at 2.26½c. a lb.

CAST IRON PIPE

Framingham, Mass., has placed 220 tons of 6 and 8-in. cement-lined pipe and Everett, Mass., 160 tons of 6 and 8-in. with the Warren Pipe Co. of New England. Otherwise recent business has been in small lots. Prices continue weak.

FABRICATED STEEL

Lettings for the week approximated 1500 tons. Rhode Island has preliminary plans for a $5,000,000 bridge between Providence and East Providence, and New Hampshire may build a $1,250,000 bridge at Newington.

OLD MATERIAL

Business is confined to small lots of No. 1 heavy melting steel for Worcester, Mass., and Pennsylvania delivery, bundled skeleton for Worcester delivery, steel turnings, mixed borings and turnings and breakable cast for Pittsburgh delivery and chemical borings for New Jersey delivery. The bundled skeleton is going into stock piles. A Rhode Island consumer, the only recent buyer of pipe, has withdrawn from the market. The Boston & Albany Railroad yesterday closed bids on a small list of scrap, the first one offered in a long time. The largest item was 300,000 lb. of heavy melting steel.

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Pacific Trade Mainly in Public Projects

SAN FRANCISCO, Oct. 26.—Pacific Coast business in steel is largely dependent upon the mining, lumbering and oil industries, and these offer little promise of an important pick-up before next spring. Meanwhile, the bulk of current tonnage is due to municipal, State and Federal construction projects.

BARS

Slightly over 1000 tons was awarded on major public contracts. With nearly 700 tons of new inquiries, domestic mill prices continue to be quoted at 2c. a lb., c.i.f., though imported bars can be landed on the Pacific Coast for well under 1.50c.

CAST IRON PIPE

Lettings total 775 tons, with new inquiries for 260 tons. Canadian sources of supply have been awarded an additional 1200 tons for municipal projects at Victoria and Vancouver, B. C.

PLATES

San Francisco has called for bids by Nov. 4 on a 24-mile emergency water pipe line that will require 7000 tons of plates for 36- and 44-in. pipe. Salem, Ore., will vote on a bond issue Dec. 15 embracing a new water system, including 26 miles of 30- and 36-in. pipe, for which $586,000 is provisionally provided. Awards for the week totaled 230 tons, with new inquiries for 7800 tons.

RAILWAY SUPPLIES

The Federal Bureau of Public Roads has called for bids on 100 tons of 128-lb. grooved girder rails for Government Island at Alameda, Cal.

STRUCTURAL SHAPES

Awards reported total 400 tons, with new inquiries for 2550 tons, including 1100 tons for a new gymnasium at the University of California at Berkeley, and 1000 tons for hangar and shops at Wheeler Field army airport, Honolulu.

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Detroit Scrap Market Dull, Prices Unchanged

DETROIT, Oct. 27.—The scrap market remains listless, with prices unchanged. Dealers do not look for increased activity until the early part of November.

▲▲▲ Non-Ferrous Metal Markets ▲▲▲

Export Copper Sales Heavy—Lead Up $2 a Ton —Zinc Weaker

NEW YORK, Oct. 27.

THE WEEK'S PRICES, CENTS PER POUND FOR EARLY DELIVERY

	Oct. 27	Oct. 26	Oct. 24	Oct. 23	Oct. 22	Oct. 21
Lake copper, New York	7.37½	7.37½	7.37½	7.37½	7.37½	7.37½
Electrolytic copper, N. Y.*	6.75	6.75	6.75	6.75	6.75	6.75
Straits tin, spot, N. Y.	22.87½	22.87½		22.75	22.87½	23.00
Zinc, East St. Louis	3.25	3.25	3.30	3.30	3.30	3.30
Zinc, New York	3.60	3.60	3.65	3.65	3.65	3.65
Lead, St. Louis	3.62½	3.57½	3.52½	3.52½	3.52½	3.52½
Lead, New York	3.75	3.75	3.75	3.75	3.75	3.75

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.
Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 6.50c. to 6.55c. a lb., New York.

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COPPER

Although the price of electrolytic copper continues at 7c. a lb., delivered Connecticut Valley, which is the quotation of custom smelters, a large foreign buying movement in the past week has served to strengthen the position of domestic sellers. Most of the week's domestic transactions were for delivery up to the end of March, but sellers are showing diminishing interest in these forward deliveries.

The heavy foreign buying, about 30,000 tons this month to the 27th, threatened to create a temporary shortage of export copper, sale of which has been in the hands of custom smelters. With the heaviest day's sales in excess of 5000 tons, the custom smelters, which have been basing offers for export on current intake of lower priced copper than is in stock, were beginning to curtail sales. This was changed, however, by re-entry of the primary producers as export sellers, and the current quotation of Copper Exporters, Inc., continued unchanged at 7.50c. a lb., c.i.f. usual European ports.

Following resumption of export selling by the primary producers, they have shown an inclination to re-enter the domestic market and sell generally at 7.25c., delivered, Connecticut Valley. Lake copper has been moderately active, and the price is unchanged at 7.37½c., delivered.

Domestic producers and foreign interests, except the Belgian representatives, who have not yet arrived in New York from Washington, have been conferring this week on curtailment of world copper output.

TIN

The domestic market has been quite inactive in the past week, and the price has fluctuated but little, with the high point 23c. a lb. on Oct. 21 and the low 22.75c. on Oct. 23. The price today was 22.87½c. Current requirements are light, and most buyers are curtailing purchases to prevent increasing inventory at this season. The London price is being maintained by group support of the market, the pool, recently formed, now holding about 12,250 tons. United Kingdom stocks are now 29,624 tons, an increase in the week of 116 tons. Shipments of tin from Singapore to Oct. 24 total 4961 tons. London prices today are £127 2s. 6d. a ton for spot standard, £129 15s. for future standard, £131 2s. 6d. for spot Straits and £132 5s. from Singapore.

LEAD

Reduction of 2800 tons in the monthly output of southeastern Missouri mines, and the recent decline in the price of lead below 4c. a lb., New York, have stimulated demand, resulting in a buying movement for delivery to the end of the year. With sellers basing sales at the present level of prices on intake, this sudden development of a buying movement has created an apparent shortage, despite fair sized stocks, so that buyers seeking substantial tonnages have been unable to secure the full amount asked for in certain instances. While the New York price is unchanged at 3.75c. a lb., the leading Western interest, which had previously reduced its price $6 a ton, when the Eastern price dropped $5 a ton, has now increased $2 a ton, advancing $1 to 3.57½c. on Oct. 26, and another $1 to 3.62½c. a lb., St. Louis, today. Buying is still active, and it is estimated that shipments for October will be in excess of 30,000 tons.

ZINC

In an effort to stimulate some demand in a quiet market, certain sellers have been offering zinc at 3.25c., East St. Louis, a decline of $1 a ton. This has brought out a small tonnage for prompt and November shipment, but does not appear to be developing a real buying movement. Sellers are generally quoting this lower price to regular customers, but have not as yet dropped their prices to the lower level on all business.

ANTIMONY

Both the Chinese metal and the domestic product are quoted at 6.50c. a lb., duty paid, New York, for prompt shipment, with small lots bringing 6.55c. a lb., duty paid. Importers suggest that 6.37½c. a lb., duty paid, could be done for future delivery, but consumers are not interested in buying ahead.

New York, Chicago or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass	13.00c.
*Copper, hot rolled, base sizes, 1000 lb. and more	16.12½c.
Seamless Tubes—	
Brass	16.25c.
Copper	15.62½c.
Brass Rods	11.25c.
Brazed Brass Tubes	21.75c.

*Extra for cold-rolled, 3c. per lb.

New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Zinc sheets, open	10.25c. to 10.50c.

Metals from New York Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	25.00c. to 26.00c.
Tin, bar	27.00c. to 29.00c.
Copper, Lake	9.00c. to 10.00c.
Copper, electrolytic	8.50c. to 9.00c.
Copper, casting	8.25c. to 8.75c.
Zinc, slab	5.00c. to 5.50c.
Lead, American pig	4.75c. to 5.75c.
Lead, bar	6.50c. to 7.50c.
Antimony, Asiatic	9.00c. to 10.00c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	20.00c. to 23.00c.
Alum. ingots, No. 12 alloy	19.00c. to 21.00c.
Babbitt metal, commercial grade	19.00c. to 29.00c.
Solder, ½ and ½	16.50c. to 17.50c.

Metals from Cleveland Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	27.00c.
Tin, bar	29.00c.
Copper, Lake	8.37½c.
Copper, electrolytic	8.37½c.
Copper, castings	8.00c.
Zinc, slab	5.00c.
Lead, American pig	4.60c. to 4.75c.
Lead, bar	7.75c.
Antimony, Asiatic	10.00c.
Babbitt metal, medium grade	15.00c.
Babbitt metal, high grade	31.00c.
Solder, ½ and ½	19.00c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses. (All prices are nominal because of uncertain condition of market.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	5.25c.	6.00c.
Copper, hvy. and wire	5.00c.	5.75c.
Copper, light and bottoms	4.25c.	5.00c.
Brass, heavy	2.75c.	3.50c.
Brass, light	2.25c.	3.00c.
Hvy. machine composition	4.00c.	4.75c.
No. 1 yel. brass turnings	3.00c.	3.50c.
No. 1 red brass or compos. turnings	3.75c.	4.50c.
Lead, heavy	2.75c.	3.25c.
Zinc	1.25c.	1.75c.
Sheet aluminum	9.00c.	11.00c.
Cast aluminum	3.25c.	5.00c.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

MILL PRICES OF SEMI-FINISHED STEEL

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	$29.00
Rerolling, 4-in. and under 10-in., Youngstown	29.00
Rerolling, 4-in. and under 10-in., Cleveland	29.00
Rerolling, 4-in. and under 10-in., Chicago	31.00
Forging quality, Pittsburgh	35.00

Sheet Bars

(Open-Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$29.00
Youngstown	29.00
Cleveland	29.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$29.00
Youngstown	29.00
Cleveland	29.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.50c.
Universal	1.50c.
Sheared	1.50c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$35.00
Cleveland	35.00
Chicago	36.00

PRICES OF RAW MATERIAL

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron, dry, Spanish or Algerian	8c. to 9c.
Iron ore, low phos., Swedish, average 68% iron	10.00c.
Iron ore, basic or foundry, Swedish, average 65% iron	9.00c.
Iron ore, basic and foundry, Russian, average 63% iron	9.00c.
Manganese ore, washed 52% manganese, from the Caucasus	25c. to 26c.
Manganese ore, African or Indian, 50 to 52%	23c. to 24c.
Manganese ore, Brazilian, 46 to 48%	22c. to 23c.
Tungsten ore, high grade, per unit, in 60% concentrates	$12.00 to $12.50

	Per Gross Ton
Chrome ore, 45% Cr_2O_3 crude, c.i.f. Atlantic seaboard	$20.00
Chrome ore, 48% Cr_2O_3, c.i.f. Atlantic seaboard	22.50

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.40
Foundry, f.o.b. Connellsville prompt	$3.25 to 4.50
Foundry, by-product, Ch'go ovens	7.50
Foundry, by-product, New England, del'd	10.50
Foundry, by-product, Newark or Jersey City, delivered	8.70 to 9.10
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.50
Mine run coking coal, f.o.b. W. Pa.	1.50 to 1.60
Gas coal, ¾-in., f.o.b. Pa. mines	1.70 to 1.80
Mine run gas coal, f.o.b. Pa. mines	1.50 to 1.60
Steam slack, f.o.b. W. Pa. mines	.30 to .40
Gas slack, f.o.b. W. Pa. mines	.50 to .70

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	*$80.00 to $85.00
Foreign, 80%, Atlantic or gulf port, duty paid	*80.00 to 85.00

*Minimum price quoted for lots of 2000 tons or more.

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$28.00 to $30.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	31.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
10%	$25.00	13%	$29.00
11%	26.00	14%	31.00
12%	27.00	15%	33.00

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$20.00	11%	$23.00
7%	20.50	12%	24.00
8%	21.00	13%	26.00
9%	21.50	14%	28.00
10%	22.00	15%	30.00

Other Ferroalloys

Ferrotungsten, per lb. contained metal del'd, carloads	$1.08
Ferrotungsten, less carloads	$1.15 to 1.25
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrochromium, 2% carbon	17.00c. to 17.50c.
Ferrochromium, 1% carbon	19.00c. to 20.00c.
Ferrochromium, 0.10% carbon	24.50c. to 26.00c.
Ferrochromium, 0.06% carbon	26.50c. to 28.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base per gross ton	91.00
Ferromolybdenum, per lb. contained Mo., delivered	1.00
Calcium molybdate, per lb. contained Mo., delivered	85c.
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton	$122.50
Silico spiegel, per ton, f.o.b. furnace, car lots	42.50
Ton lots or less, per ton	47.50
Silico-manganese, gross ton, delivered: 2.50% carbon grade	105.00
1% carbon grade	115.00
Spot prices	$5 a ton higher

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$13.00
No. 2 lump, Illinois and Kentucky mines	17.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	17.00
Domestic, No. 1 ground bulk, 96 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	32.00

Fire Clay Brick

Per 1000 f.o.b. Works

	High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$40.00	$32.00 to $35.00
Maryland	40.00	32.00 to 35.00
New Jersey	$44.00 to 59.00	.....
Ohio	40.00	32.00 to 35.00
Kentucky	40.00	32.00 to 35.00
Missouri	37.00	32.00 to 35.00
Illinois	40.00	32.00 to 35.00
Ground fire clay, per ton	6.50	

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	$40.00
Chicago	49.00
Birmingham	50.00
Silica clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

MILL PRICES OF BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	73 and 10
†Carriage bolts	73 and 10
Lag bolts	73 and 10
Plow bolts, Nos. 1, 2, 3 and 7 heads	73 and 10
Hot-pressed nuts, blank or tapped, square,	73 and 10
Hot-pressed nuts, blank or tapped, hexagons,	73 and 10
C.p.c. and t. square or hex. nuts, blank or tapped	73 and 10
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled thread up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagons nuts	73 and 10
Semi-finished hexagons castellated nuts, S.A.E.,	73 and 10
Stove bolts in packages, P'gh.	80, 10, 10, 10 and 5
Stove bolts in packages, Ch'go.	80, 10, 10, 10 and 5
Stove bolts in pkgs., Cleveland.	80, 10, 10, 10 and 5
Stove bolts in bulk, P'gh.	80, 10, 10, 10, 5 and 2½
Stove bolts in bulk, Ch'go.	80, 10, 10, 10, 5 and 2½
Stove bolts in bulk, Cleveland,	80, 10, 10, 10, 5 and 2½
Tire bolts	60, 10 and 10

Discounts of 73 and 10 per cent off on bolts and nuts apply on carload business with jobbers and large consumers.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.25
F.o.b. Chicago	2.35

Small Rivets

(⅞-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10, 10 and 5
Milled standard set screws, case hardened,	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S.S. thread,	85 and 10
Upset hex. cap screws, S.A.E. thread	85 and 10
Upset set screws	80, 10 and 5
Milled studs	70

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel — *Base per Lb.*

F.o.b. Pittsburgh mill....1.60c.
F.o.b. Chicago....1.70c.
Del'd Philadelphia....1.89c.
Del'd New York....1.93c.
F.o.b. Cleveland....1.65c.
F.o.b. Lackawanna....1.70c.
F.o.b. Birmingham....1.70c.
C.i.f. Pacific ports....2.00c.

Billet Steel Reinforcing

F.o.b. P'gh mills, 40, 50, 60-ft....1.60c.
F.o.b. Birmingham, mill lengths....1.75c.
F.o.b. Cleveland....1.50c. to 1.55c.

Rail Steel

F.o.b. mills, east of Chicago dist....1.30c. to 1.35c.
F.o.b. Chicago Heights mill....1.50c. to 1.60c.
Del'd Philadelphia....1.49c. to 1.59c.

Iron

Common iron, f.o.b. Chicago....1.70c.
Refined iron, f.o.b. P'gh mills....2.75c.
Common iron, del'd Philadelphia....2.09c.
Common iron, del'd New York....2.14c.

Tank Plates

Base per Lb.

F.o.b. Pittsburgh mill....1.60c.
F.o.b. Chicago....1.70c.
F.o.b. Birmingham....1.70c.
Del'd Cleveland....1.78½c.
Del'd Philadelphia....1.80½c.
F.o.b. Coatesville....1.70c.
F.o.b. Sparrows Point....1.70c.
F.o.b. Lackawanna....1.70c.
Del'd New York....1.88c.
C.i.f. Pacific ports....1.85c. to 1.90c.

Structural Shapes

Base per Lb.

F.o.b. Pittsburgh mill....1.60c.
F.o.b. Chicago....1.70c.
F.o.b. Birmingham....1.70c.
F.o.b. Lackawanna....1.70c.
F.o.b. Bethlehem....1.70c.
Del'd Cleveland....1.78½c.
Del'd Philadelphia....1.71c. to 1.76c.
Del'd New York....1.85¼c.
C.i.f. Pacific ports....2.05c.

Hot-Rolled Hoops, Bands and Strips

Base per Lb.

6 in. and narrower, Pittsburgh....1.60c. to 1.65c.
Wider than 6 in., P'gh....1.50c. to 1.55c.
6 in. and narrower, Chicago....1.75c.
Wider than 6 in., Chicago....1.65c.
Cooperage stock, P'gh....1.75c. to 1.85c.
Cooperage stock, Chicago....1.85c. to 1.95c.

Cold-Finished Steel

Base per Lb.

Bars, f.o.b. Pittsburgh mill....2.10c.
Bars, f.o.b. Chicago....2.10c.
Bars, Cleveland....2.10c.
Bars, Buffalo....2.10c.
Shafting, ground, f.o.b. mill....*2.45c. to 3.40c.
Strips, P'gh....2.05c. to 2.15c.
Strips, Cleveland....2.15c.
Strips, deliv'd Chicago....2.33c. to 2.43c.
Strips, Worcester....2.30c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland....3.10c. to 3.20c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

Bright wire....2.20c.
Spring wire....3.20c.

To Jobbing Trade

Base per Keg

Standard wire nails....$1.90
Smooth coated nails....1.90
Galvanized nails....3.90

Base per Lb.

Smooth annealed wire....2.35c.
Smooth galvanized wire....2.80c.
Polished staples....2.35c.
Galvanized staples....2.60c.
Barbed wire, galvanized....2.55c.
Woven wire fence, Nos. 9 and 11 gage, per net ton....$55.00
Woven wire fence, No. 12½ gage and lighter, per net ton....60.00

To Retail Trade

Base per Keg

Standard wire nails....$2.00
Cement coated nails....2.00
Galvanized nails....4.00

Base per Lb.

Smooth annealed wire....2.45c.
Smooth galvanized wire....2.90c.

Base per Lb.

Polished staples....2.45c.
Galvanized staples....2.70c.
Barbed wire, galvanized....2.65c.
Woven wire fence, Nos. 9 and 11 gage, per net ton....$60.00
Woven wire fence, 12½ gage and lighter, per net ton....65.00

Anderson, Ind., mill prices are ordinarily $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

Sheets

Hot-Rolled

Base per Lb.

No. 10, f.o.b. Pittsburgh....1.70c.
No. 10, f.o.b. Chicago mills....1.80c.
No. 10, del'd Philadelphia....1.99c.
No. 10, f.o.b. Birmingham....1.85c.
No. 10, c.i.f. Pacific Coast ports....2.33c.

Hot-Rolled and Annealed

No. 10, Pittsburgh....1.85c.
No. 10, Chicago mills....1.95c.
No. 10, Birmingham....2.00c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh....2.40c.
No. 24, f.o.b. Chicago mills....2.50c.
No. 24, del'd Philadelphia....2.69c.
No. 24, f.o.b. Birmingham....2.55c.
No. 24, c.i.f. Pacific Coast ports....2.88c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh....2.35c.
No. 10 gage, f.o.b. Chicago mills....2.45c.
No. 10 gage, del'd Philadelphia....2.64c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh....2.95c.
No. 20 gage, f.o.b. Chicago mills....3.05c.
No. 20 gage, del'd Philadelphia....3.24c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh....3.10c.

Steel Furniture Sheets

No. 10, f.o.b. Pittsburgh....2.75c.
No. 20, f.o.b. Pittsburgh....3.35c.

(Prices on furniture stock include stretcher leveling but not resquaring.)

Galvanized Sheets

No. 24, f.o.b. Pittsburgh....2.90c.
No. 24, f.o.b. Chicago mills....3.00c.
No. 24, del'd Philadelphia....3.19c.
No. 24, f.o.b. Birmingham....3.05c.
No. 24, c.i.f. Pacific Coast ports....3.38c.

Long Ternes

No. 24, unassorted, 8-lb. coating, f.o.b. P'gh 3.15c.

Vitreous Enameling Stock

No. 10, f.o.b. Pittsburgh....2.90c.
No. 20, f.o.b. Pittsburgh....3.40c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh....2.65c.
No. 28, Chicago mills....2.75c.

Tin Plate

Base per Box

Standard cokes, f.o.b. P'gh district mills....$4.75
Standard cokes, f.o.b. Gary....4.85

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.30
15-lb. coating I.C.	12.90
20-lb. coating I.C.	14.00
25-lb. coating I.C.	$15.20
30-lb. coating I.C.	16.00
40-lb. coating I.C.	17.80

Alloy Steel Bars

(F.o.b. maker's mill)
Alloy Quantity Bar Base, 2.65c. per Lb.

S.A.E. Series Numbers		Alloy Differential per 100 Lb.
2000	(½% Nickel)	$0.25
2100	(1½% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum (1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bar	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Rounds and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

Per Gross Ton

Standard, f.o.b. mill....$43.00
Light (from billets), f.o.b. mill....34.00
Light (from rail steel), f.o.b. mill....32.00

Track Equipment

Base per 100 Lb.

Spikes, ⅝ in. and larger....$2.70
Spikes, ½ in. and larger....2.70
Spikes, boat and barge....2.90
Tie plate, steel....1.85
Angle bars....2.75
Track bolts, to steam railroads....$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count....73 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	47	21½	¼ and ⅜	+11	+36
¼ to ⅜	53	27½	½	23	5
½	58	44½	¾	28	11
¾	62	50½	1 and 1¼	31	15
1 to 3	64	52½	1½ and 2	35	18

Lap Weld

2	57	45½	2	23	9
2½ to 6	61	49½	2½ to 3½	28	13
7 and 8	58	45½	4 to 6	30	17
9 and 10	56	43½	7 and 8	29	16
11 and 12	55	42½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	43	26½	¼ and ⅜	+13	+48
¼ to ⅜	49	32½	½	23	7
½	55	44½	¾	28	12
¾	60	49½	1 to 2	34	18
1 to 1½	62	51½			
2 to 3	63	52½			

Lap Weld, extra strong, plain ends

2	55	44½	2	29	13
2½ to 4	59	48½	2½ to 4	34	20
4½ to 6	58	47½	4½ to 6	33	19
7 to 8	54	41½	7 and 8	31	17
9 and 10	47	34½	9 to 12	21	8
11 and 12	46	33½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discounts of 5 and 2½%, and on galvanized by 1½ points with supplementary discounts of 5 and 2½%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—3¾ in.	54	2 in.—2¼ in.	13
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	61	3 in.	46
1¼ to 1½ in.	53	3¼ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Per Cent Off List

Carbon, 0.10% to 0.30% base (carloads)....55
Carbon, 0.30% to 0.40% base....50

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

Pig Iron Prices for All Districts

VALLEY

Per gross ton, f.o.b. Valley furnace:

Basic	$15.00
Bessemer	16.50
Gray forge	16.00
No. 2 foundry	16.00
No. 3 foundry	15.50
Malleable	16.50
Low phos., copper free	$26.66 to 27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

PITTSBURGH

Per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$15.50 to $16.00
No. 2 foundry	17.00
No. 3 foundry	16.50
Malleable	17.00
Bessemer	17.00

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

CHICAGO

Per gross ton at Chicago furnace:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$17.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	17.50
Malleable, not over 2.25 sil.	17.00
High phosphorus	17.00
Lake Super. charcoal, sil. 1.50	$25.04 to 27.04
S'th'n No. 2 fdy.	17.01
Low phos., sil. 1 to 2, copper free	28.50 to 29.20
Silvery, sil. 8 per cent	24.79 to 26.79
Bess. ferrosilicon, 14-15 per cent	35.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including an average switching charge of 61c. per gross ton.

ST. LOUIS

Per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25 f.o.b. Granite City, Ill.	$17.50
Malleable, f.o.b. Granite City	17.50
N'th'n No. 2 fdy., del'd St. Louis	19.16
Southern No. 2 fdy., deliv'd	15.42
Northern malleable, deliv'd	19.16
Northern basic, deliv'd	19.16

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

NEW YORK

Per gross ton, delivered New York district:

*Buffalo No. 2, del'd east. N. J.	$17.78 to $18.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	16.89 to 17.39
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	17.89 to 18.39

Freight rates: $1.39 to $2.52 from eastern Pennsylvania.

*Prices delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

BUFFALO

Per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$17.00
No. 2X fdy., sil. 2.25 to 2.75	17.50
No. 1 fdy., sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	17.00
Lake Superior charcoal	25.28

NEW ENGLAND

Per gross ton delivered to most New England points:

*Buffalo, sil. 1.75 to 2.25	$19.91
*Buffalo, sil. 2.25 to 2.75	19.91
†Buffalo, sil. 1.75 to 2.25	19.28
†Buffalo, sil. 2.25 to 2.75	19.28
*Ala., sil. 1.75 to 2.25	$20.11 to 20.61
*Ala., sil. 2.25 to 2.75	20.61 to 21.11
†Ala., sil. 1.75 to 2.25	16.75
†Ala., sil. 2.25 to 2.75	17.25

Freight rates: $4.91 all rail and $4.28 rail and water from Buffalo; $9.61 all rail from Alabama and $5.75 rail and water from Alabama to New England seaboard.

*All rail rate.

†Rail and water rate.

CINCINNATI

Per gross ton, delivered Cincinnati:

Ala. fdy., sil. 1.75 to 2.25	$14.69
Ala. fdy., sil. 2.25 to 2.75	15.19
Tenn. fdy., sil. 1.75 to 2.25	14.69
S'th'n Ohio silvery, 8 per cent	23.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

PHILADELPHIA

Per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$15.76 to $18.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	16.26 to 17.26
East. Pa. No. 1X	16.76 to 17.76
Basic (del'd east. Pa.)	16.51
Malleable	19.00 to 20.00
Stand. low phos. (f.o.b. east. Pa. furnace)	23.00 to 24.00
Cop. b'r'g low phos. (f.o.b. furnace)	22.00 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.04
Va. No. 2, 2.25 to 2.75 sil.	22.54

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

CLEVELAND

Per gross ton at Cleveland furnace:

N'th'n fdy., sil. 1.75 to 2.25	$17.01
S'th'n fdy., sil. 1.75 to 2.25	17.01
Malleable	17.00
Ohio silvery, 8 per cent	24.01
Stand. low phos., Valley	27.00

Prices are f.o.b. furnace except to Southern foundry and silvery iron. Freight rates: 50c. average local switching charge; $3 from Jackson, Ohio; $6.81 from Birmingham.

BIRMINGHAM

Per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$12.00
No. 1 fdy., 2.25 to 2.75 sil.	12.50
Basic	12.00

CANADA

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$24.60
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.60
Basic	$23.00 to 23.50

Old Material Quotations

PITTSBURGH

Per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$10.00 to $10.25
No. 2 heavy melting steel	9.00 to 9.50
Scrap rails	10.00 to 10.50
Compressed sheet steel	9.50 to 10.00
Bundled sheets, sides and ends	9.00 to 9.50
Cast iron carwheels	10.50 to 11.00
Sheet bar crops, ordinary	11.00 to 11.50
Heavy breakable cast	8.00 to 8.50
No. 2 railroad wrought	10.00 to 10.50
Hvy. steel axle turnings	9.00 to 9.50
Machine shop turnings	7.00 to 7.50
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	11.00 to 11.50
Railr. coil and leaf springs	11.00 to 11.50
Rolled steel wheels	11.00 to 11.50
Low phos. billet and bloom ends	13.50 to 14.00
Low phos. mill plates	12.00 to 12.50
Low phos. light grades	12.00 to 12.50
Low phos. sheet bar crops	13.00 to 13.50
Heavy steel axle turnings	9.00 to 9.50
Electric Furnace Grades:	
Low phos. punchings	12.50 to 13.00
Heavy steel axle turnings	9.00 to 9.50
Blast Furnace Grades:	
Short shoveling steel turnings	7.25 to 7.75
Short mixed borings and turnings	7.25 to 7.75
Cast iron borings	7.25 to 7.75
Rolling Mill Grades:	
Steel car axles	15.50 to 16.50
Cupola Grades:	
No. 1 cast	9.50 to 10.50
Rails 3 ft. and under	12.00 to 12.50

CHICAGO

Delivered Chicago district consumers:

Per Gross Ton

Basic Open-Hearth Grades:	
Heavy melting steel	$7.75 to $8.25
Shoveling steel	7.75 to 8.25
Frogs, switches and guards, cut apart, and misc. rails	7.75 to 8.25
Factory hyd. comp. sheets	6.50 to 7.00
Drop forge flashings	5.50 to 6.00
No. 1 busheling	5.75 to 6.25
Forg'd cast and r'l'd steel carwheels	8.25 to 9.25
Railroad tires, charg. box size	9.00 to 9.50
Railroad leaf springs cut apart	9.50 to 10.00
Axle turnings	6.00 to 6.50
Acid Open-Hearth Grades:	
Steel couplers and knuckles	8.50 to 9.00
Coil springs	9.50 to 10.00
Electric Furnace Grades:	
Axle turnings	6.00 to 6.50
Low phos. punchings	10.00 to 10.50
Low phos. plates, 12 in. and under	9.00 to 9.50
Blast Furnace Grades:	
Cast iron borings	4.00 to 4.50
Short shoveling turnings	4.00 to 4.50
Machine shop turnings	4.00 to 4.50
Rolling Mill Grades:	
Rerolling rails	10.00 to 10.50
Cupola Grades:	
Steel rails, less than 3 ft.	9.25 to 9.75
Steel rails, less than 2 ft.	10.00 to 10.50
Angle bars, steel	8.50 to 9.00
Cast iron carwheels	9.00 to 9.50
Malleable Grades:	
Railroad	7.00 to 7.50
Agricultural	7.00 to 7.50
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	19.00 to 21.00
*Relaying rails, 65 lb. and heavier	22.00 to 25.00

Per Net Ton

Rolling Mill Grades:		
Iron angle and splice bars	7.00 to	7.50
Iron pitch bars and transoms	8.00 to	8.50
Iron car axles	13.50 to	14.50
Steel car axles	10.50 to	11.00
No. 1 railroad wrought	6.50 to	7.00
No. 2 railroad wrought	6.75 to	7.25
No. 1 busheling	5.50 to	6.00
No. 2 busheling	4.00 to	4.50
Locomotive tires, smooth	10.50 to	11.50
Pipes and flues	4.50 to	5.00
Cupola Grades:		
No. 1 machinery cast	8.50 to	9.00
No. 1 railroad cast	7.00 to	7.50
No. 1 agricultural cast	7.00 to	7.50
Stove plate	6.25 to	6.75
Grate bars	5.50 to	6.00
Brake shoes	5.75 to	6.25

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$7.50 to	$8.50
No. 2 heavy melting steel		7.00
No. 1 railroad wrought	10.00 to	10.50
Bundled sheets (for steel works)		6.00
Hydraulic compressed, new	7.00 to	7.50
Hydraulic compressed, old	6.00 to	6.50
Machine shop turnings (for steel works)	5.50 to	6.00
Heavy axle turnings (or equiv.)	7.00 to	8.00
Cast borings (for steel works and roll. mill)	5.50 to	6.00
Heavy breakable cast (for steel works)		9.50
Railroad grate bars		7.50
Stove plate (for steel works)		7.50
No. 1 low phos., hvy. (0.04% and under)	12.00 to	13.00
Couplers and knuckles		11.00
Rolled steel wheels		11.00
No. 1 blast furnace		5.50
Wrot. iron and soft steel pipe and tubes (new specific.)	10.50 to	11.00
Shafting	15.00 to	15.50
Steel axles	16.00 to	16.50
No. 1 forge fire	7.50 to	8.00
Cast iron carwheels	12.00 to	12.50
No. 1 cast	11.00 to	11.50
Cast borings (for chem. plant)	11.50 to	12.00
Steel rails for rolling		10.50

CLEVELAND

Per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel	$8.00 to	$8.50
No. 2 heavy melting steel	7.00 to	7.50
Compressed sheet steel	7.50 to	7.75
Light bundled sheet stampings	6.00 to	6.50
Drop forge flashings	6.00 to	6.50
Machine-shop turnings	5.00 to	5.50
Short shoveling turnings	6.50 to	7.00
No. 1 railroad wrought	9.50 to	10.00
No. 2 railroad wrought	10.00 to	10.50
No. 1 busheling	6.75 to	7.00
Pipes and flues	5.50 to	6.00
Steel axle turnings	7.50 to	8.00
Acid Open-Hearth Grades:		
Low phos., billet bloom and slab crops	14.00 to	14.50
Blast Furnace Grades:		
Cast iron borings	6.50 to	6.75
Mixed borings and short turnings	6.50 to	6.75
No. 2 busheling	6.00 to	6.25
Cupola Grades:		
No. 1 cast	9.00 to	9.50
Railroad grate bars	6.00 to	6.50
Stove plate	6.00 to	6.50
Rails under 3 ft.	15.00 to	15.50
Miscellaneous:		
Rails for rolling	13.00 to	13.50
Railroad malleable	11.00 to	11 25

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel		$9.00
No. 2 heavy melting scrap	$7.50 to	8.00
Scrap rails	9.50 to	10.00
Hydraul. comp. sheets		7.50
No. 2 hydraul. comp. sheets		7.00
Hand bundled sheets		7.00
Drop forge flashings		7.50
No. 1 busheling	7.50 to	8.00
Hvy. steel axle turnings	8.00 to	8.50
Machine shop turnings	4.50 to	5.00
No. 1 railroad wrought	7.50 to	8.00
Acid Open-Hearth Grades:		
Knuckles and couplers		10.00
Coil and leaf springs		10.00
Rolled steel wheels		10.00
Low phos. billet and bloom ends	12.50 to	13.00
Electric Furnace Grades:		
Short shov. steel turnings	7.00 to	7.50
Blast Furnace Grades:		
Short mixed borings and turnings	6.00 to	6.50
Cast iron borings	6.00 to	6.50
No. 2 busheling	4.50 to	5.00
Rolling Mill Grades:		
Steel car axles		12.00
Iron axles	16.00 to	16.50
Cupola Grades:		
No. 1 machinery cast	10.00 to	10.50
Stove plate	8.25 to	8.50
Locomotive grate bars	7.00 to	7.50
Steel rails, 3 ft. and under	12.00 to	12.50
Cast iron carwheels	10.50 to	11.00
Malleable Grades:		
Industrial	10.00 to	10.50
Railroad	10.00 to	10.50
Agricultural	10.00 to	10.50
Special Grades:		
Chemical borings	9.00 to	9.50

BIRMINGHAM

Per gross ton delivered Birmingham district consumers' yards:

Heavy melting steel	$8.50 to	$9.00
Scrap steel rails	8.50 to	9.00
Short shoveling turnings	4.00 to	5.00
Cast iron borings	(No market)	
Stove plate		6.00
Steel axles		14.00
Iron axles		14.00
No. 1 railroad wrought		6.50
Rails for rolling		10.00
No. 1 cast		9.00
Tramcar wheels	10.00 to	10.25
Cast iron borings, chem.		9.00

ST. LOUIS

Dealers' buying prices per gross ton:

Selected heavy melting steel	$7.50 to	$8.00
No. 1 heavy melting or shoveling steel	7.00 to	7.50
No. 2 heavy melting or shoveling steel	6.75 to	7.25
No. 1 locomotive tires	8.00 to	8.50
Misc. stand-sec. rails including frogs, switches and guards, cut apart	8.25 to	8.75
Railroad springs	8.75 to	9.25
Bundled sheets	4.25 to	4.75
No. 2 railroad wrought	7.00 to	7.50
No. 1 busheling	6.00 to	6.50
Cast iron borings and shoveling turnings	4.75 to	5.25
Iron rails	7.00 to	8.00
Rails for rolling	9.50 to	10.00
Machine shop turnings	3.00 to	3.50
Heavy turnings	5.50 to	6.00
Steel car axles	10.50 to	11.00
Iron car axles	14.00 to	14.50
Wrot. iron bars and trans.	5.50 to	6.00
No. 1 railroad wrought	5.00 to	5.50
Steel rails, less than 3 ft.	10.00 to	10.50
Steel angle bars	7.00 to	7.50
Cast iron carwheels	6.50 to	7.00
No. 1 machinery cast	8.00 to	8.50
Railroad malleable	5.50 to	6.00
No. 1 railroad cast	6.25 to	6.75
Stove plate	6.50 to	7.00
Relay. rails, 60 lb. and under	16.00 to	16.50
Relay. rails, 70 lb. and over	20.00 to	21.00
Agricult. malleable	5.00 to	5.50

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$4.50 to	$6.50
Heavy melting steel (yard)	2.75 to	3.00
No. 1 hvy. breakable cast	5.50 to	6.00
Stove plate (steel works)		3.50
Locomotive grate bars		3.50
Machine shop turnings		2.00
Short shoveling turnings		2.00
Cast borings (blast fur. or steel works)		2.50
Mixed borings and turnings		2.00
Steel car axles	11.00 to	11.50
Iron car axles (nom.)	14.00 to	14.50
Iron and steel pipe (1 in. dia., not under 2 ft. long)		5.50
Forge fire	3.25 to	3.75
No. 1 railroad wrought	5.25 to	5.75
No. 1 yard wrought, long	4.25 to	4.75
Rails for rolling	6.25 to	6.50
Stove plate (foundry)	4.75 to	5.50
Malleable cast (railroad)	6.00 to	6.50
Cast borings (chemical)	8.00 to	8.50
Per gross ton, delivered local foundries:		
No. 1 machinery cast		$8.50
No. 1 hvy. cast (columns, bldg. materials, etc.; cupola size)		6.50
No. 2 cast (radiators, cast boilers, etc.)		5.50

BOSTON

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$3.80 to	$4.60
Scrap T rails	4.10 to	4.60
Scrap girder rails	3.10 to	3.60
No. 1 railroad wrought	4.50 to	5.00
Machine shop turnings	1.25 to	2.10
Cast iron borings (steel works and rolling mill)	1.50 to	1.75
Bundled skeleton, long	3.00 to	3.25
Forge flashings	3.00 to	3.50
Blast furnace borings and turnings	1.25 to	1.30
Forged scrap	2.00 to	2.50
Shafting	10.00 to	10.50
Steel car axles	11.00 to	12.00
Wrought pipe, 1 in. in diameter (over 2 ft. long)	4.00 to	4.25
Rails for rolling	8.50 to	9.00
Cast iron borings, chemical	7.00 to	7.25
No. 2 cast	4.85 to	5.00
Per gross ton delivered consumers' yards:		
Textile cast	$9.50 to	$10.00
No. 1 machinery cast	9.50 to	10.00
Stove plate	5.00 to	5.25
Railroad malleable	10.50 to	11.00

CINCINNATI

Dealers' buying prices per gross ton:

Heavy melting steel	$6.75 to	$7.25
Scrap rails for melting	8.50 to	9.00
Loose sheet clippings	3.50 to	4.00
Bundled sheets	5.50 to	6.00
Cast iron borings	3.25 to	3.75
Machine shop turnings	4.00 to	4.50
No. 1 busheling	5.00 to	5.50
No. 2 busheling	3.25 to	3.75
Rails for rolling	9.00 to	9.50
No. 1 locomotive tires	8.50 to	9.00
No. 2 railroad wrought	6.75 to	7.25
Short rails	11.75 to	12.25
Cast iron carwheels	8.25 to	8.75
No. 1 machinery cast	10.00 to	10.50
No. 1 railroad cast	8.75 to	9.25
Burnt cast	4.25 to	4.75
Stove plate	4.25 to	4.75
Brake shoes	4.25 to	4.75
Agricultural malleable	8.00 to	8.50
Railroad malleable	9.00 to	9.50

DETROIT

Dealers' buying prices per gross ton:

Hvy. melting and shov. steel	$6.00 to	$6.50
Borings and short turnings	4.50 to	5.00
Long turnings	4.00 to	4.50
No. 1 machinery cast	8.50 to	9.00
Automotive cast	11.00 to	11.50
Hydraul. comp. sheets	5.75 to	6.25
Stove plate	5.00 to	5.50
New No. 1 busheling	5.00 to	5.50
Old No. 2 busheling	3.25 to	3.75
Sheet clippings	3.50 to	4.00
Flashings	5.25 to	5.75

CANADA

Dealers buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$7.00	$6.00
Rails, scrap	7.00	6.00
No. 1 wrought	6.00	8.00
Machine shop turnings	2.00	2.00
Boiler plate	5.00	4.50
Heavy axle turnings	2.50	2.50
Cast borings	2.00	2.00
Steel borings	2.00	2.00
Wrought pipe	2.00	2.00
Steel axles	7.00	9.00
Axles, wrought iron	7.00	11.00
No. 1 machinery cast	....	10.00
Stove plate	....	8.00
Standard carwheels	....	8.50
Malleable	....	8.00
Per Net Ton		
No. 1 machinery cast	11.00	....
Stove plate	9.00	....
Standard carwheels	10.00	....
Malleable scrap	9.00	....

Warehouse Prices for Iron and Steel Products

CHICAGO

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.75c.
Reinforcing bars, billet steel	1.40c. to 1.80c.
Rail steel reinforcement—	
For buildings	1.25c. to 1.50c.
Highway slabs	1.40c.
For bridges and culverts	1.50c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.10c.
Flats and squares	3.60c.
Bands, 7/8 in. (in Nos. 10 and 12 gages)	2.95c.
Hoops (No. 14 gage and lighter)	3.50c.
Hot-rolled annealed sheets (No. 24)	3.55c.
Galv. sheets (No. 24)	4.10c.
Hot-rolled sheets (No. 10)	3.20c.
Spikes (7/8 in. and larger)	3.45c.
Track bolts	4.30c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.

	Per Cent Off List
Machine bolts	73
Carriage bolts	73
Coach and lag screws	73
Hot-pressed nuts, sq., tap. or blank	73
Hot-pressed nuts, hex., tap. or blank	73
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	2.30
Cement c't'd nails, base per keg	2.30

CLEVELAND

	Base per Lb.
Plates and struc. shapes	2.95c.
Soft steel bars	2.75c.
Reinforc. steel bars	1.75c. to 1.95c.
Cold-fin. rounds and hex.	3.10c.
Cold-fin. flats and sq.	3.60c.
Hoops and bands, No. 12 to 7/8 in., inclusive	3.00c.
Hoops and bands, No. 13 and lighter	3.55c.
Cold-finished strip	*5.55c.
Hot-rolled annealed sheets (No. 24)	3.60c.
Galvanized sheets (No. 24)	4.00c.
Hot-rolled sheets (No. 10)	3.00c.
No. 9 ann'l'd wire, per 100 lb.	$2.25
No. 9 galv. wire, per 100 lb.	2.70
Com. wire nails, base per keg	2.25

*Net base, including boxing and cutting to length.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
New billet reinforc. bars	3.00c.
Rail steel reinforc. bars	3.00c.
Hoops	3.90c.
Bands	3.20c.
Cold-fin. rounds and hex.	3.50c.
Squares	4.00c.
Hot-rolled annealed sheets (No. 24)	3.75c.
Galv. sheets (No. 24)	4.25c.
Hot-rolled sheets (No. 10)	3.30c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg (10 to 49 kegs)	2.65
Larger quantities	2.50
Cement c't'd nails, base 100-lb. keg	2.95
Chain, per 100 lb.	10.25

	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$17.50
4-in.	36.00
Lap-welded steel boiler tubes, 2-in.	16.50
4-in.	34.50

BUFFALO

	Base per Lb.
Plates and struc. shapes	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.65c.
Cold-fin. flats and sq.	3.65c.
Rounds and hex.	3.15c.
Cold-rolled strip steel	5.25c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.10c.
Bands	3.35c.
Hoops	3.90c.
Hot-rolled sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$2.45
Black wire, base per 100 lb.	3.20

NEW YORK

	Base per Lb.
Plates and struc. shapes	2.70c. to 3.10c.
Soft steel bars, small shapes	2.70c. to 3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.75c.
Bands	3.40c.
Hot-rolled sheets (No. 10)	3.00c. to 3.25c.
Hot-rolled ann'l'd sheets (No. 24*)	3.60c.
Galvanized sheets (No. 24*)	4.00c.
Long terne sheets (No. 24)	5.00c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, 1/2 x 1/4 in. and larger	3.40c.
Smooth finish, 1 to 2 1/2 x 1/4 in. and larger	3.75c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

	Per Cent Off List
Machine bolts, cut thread:	
5/8 x 6 in. and smaller	65 to 65 and 10
1 x 30 in. and smaller	65 to 65 and 10
Carriage bolts, cut thread:	
1/2 x 6 in. and smaller	65 to 65 and 10
3/4 x 20 in. and smaller	65 to 65 and 10

	Per 100 Ft.
Boiler Tubes:	
Lap welded, 2-in.	$19.00
Seamless steel, 2-in.	20.25
Charcoal iron, 2-in.	26.25
Charcoal iron, 4-in.	67.00

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
Cold-fin. rounds, shafting, screw stock	3.35c.
Hot-rolled annealed sheets (No. 24)	3.80c.
Galv. sheets (No. 24)	4.35c.
Hot-rolled sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	3.85c.
Galv. corrug. sheets	4.40c.
Structural rivets	4.00c.
Boiler rivets	4.00c.

	Per Cent Off List
Tank rivets, 7/8-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	73
Carriage bolts	73
Lag screws	73
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	73
Less than 200 lb.	63
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	73
Less than 200 lb.	63

PACIFIC COAST

(Less than 5000 Lb.)

	Base per Lb. San Francisco	Los Angeles	Seattle
Plates and struc. shapes, 1/4-in. and heavier	2.80c.	3.00c.	2.25c.
Soft steel bars	2.80c.	3.00c.	2.25c.
Reinforcing bars	2.80c.	2.80c.	3.00c.
Hot-rolled annealed sheets (No. 24)	3.90c.	4.00c.	3.50c.
Hot-rolled sheets (No. 10)	3.40c.	3.50c.	3.00c.
Galv. sheets (No. 24)	4.40c.	4.20c.	4.00c.
Struc. rivets, 1/2 in. and larger, less than 1000 lb.	5.00c.	5.00c.	5.50c.
Special nails; common 4 to 60d; smooth box 4 to 20d; finish 6 and 8 d; base per keg	$2.55	$2.45	$2.40
Other wire nails, base per keg	2.80	2.70	2.65
Cement c't'd nails, 100-lb. keg	2.65	2.70	2.65

PITTSBURGH

	*Base per Lb.
Plates	2.45c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.80c.
Reinforcing steel bars	2.60c.
Cold-finished and screw stock—	
Rounds and hexagons	3.15c.
Squares and flats	3.60c.
Bands	2.95c.
Hoops	3.60c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.65c.
Galv. sheets (No. 24), 25 or more bundles	3.65c.
Hot-rolled sheets (No. 10)	3.15c. to 3.20c.
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.)	3.74c.
Spikes, large	2.50c.
Small	2.75c. to 2.80c.
Boat	3.00c.
Track bolts, all sizes, per 100 count,	73 and 10 per cent off list
Machine bolts, 100 count,	73 and 10 per cent off list
Carriage bolts, 100 count,	73 and 10 per cent off list
Nuts, all styles, 100 count,	73 and 10 per cent off list
Large rivets, base per 100 lb.	$3.00
Wire, black, soft ann'l'd, base per 100 lb.	2.30
Wire, galv. soft, base per 100 lb.	2.75
Common wire nails, per keg	$2.05 to 2.15
Cement coated nails, per keg	2.05 to 2.15

*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

PHILADELPHIA

	Base per Lb.
Plates, 1/4-in. and heavier	2.50c.
Structural shapes	2.50c.
Soft steel bars, small shapes, iron bars (except bands)	2.60c.
Reinforc. steel bars, sq., twisted and deform.	2.30c.
Cold-fin. steel, rounds and hex.	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.15c.
Steel bands, No. 12 to 7/8-in., inclu	2.90c.
Spring steel	5.00c.
Hot-rolled box annealed sheets (No. 24)	3.55c.
Galvanized sheets (No. 24)	4.00c.
Hot rolled blue annealed sheets (No. 10)	3.05c.
Diam. pat. floor plates, 1/4-in.	5.20c.
Swedish iron bars	6.60c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

BOSTON

	Base per Lb.
Plates	*3.25c.
Structural shapes—	
Angles and beams	*3.35c.
Tees	*3.35c.
Zees	*3.35c.
Soft steel bars, small shapes	*3.25c.
Reinforcing bars	3.10c. to 3.25c.
Iron bars—	
Refined	3.25c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	*3.75c. to 4.25c.
Hoop steel	4.90c. to 5.40c.
Cold-rolled steel—	
Rounds and hex.	3.50c. to 5.50c.
Squares and flats	4.00c. to 6.00c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.80c.

	Per Cent Off List
Machine bolts	65 and 5
Carriage bolts	65 and 5
Lag screws	65 and 5
Hot-pressed nuts	40 and 10
Cold-punched nuts	40 and 10
Stove bolts	70 and 10

*Base price (250 to 999 lb.); less than 250 lb., add 50c. per 100 lb.; 1000 to 7999 lb., deduct 15c.; 8000 to 14,999 lb., deduct 25c.; 15,000 lb. and larger lots, deduct 35c.

Fabricated Structural Steel

NEW fabricated structural steel projects totaling 9500 tons are the smallest since the first week in January, 1929, and compare with 14,500 tons a week ago, and 10,000 tons two weeks ago. The only sizable projects are 3000 tons for a grade crossing elimination on the New York Central Railroad at Buffalo, 1100 tons for a gymnasium at the University of California, and 1000 tons for a hangar and shops at Wheeler Field, Honolulu. Awards of about 9000 tons are the smallest since the last week in June, and compare with 15,000 tons a week ago and 11,500 tons two weeks ago. The only sizable award reported is 1400 tons for the Harlem Valley hospital at Wingdale, N. Y. Awards follow:

NORTH ATLANTIC STATES

East Boston, 232 tons, aircraft building, to New England Structural Co.

Cambridge, Mass., 216 tons, Radcliffe College units, to New England Structural Co.

Exeter, N. H., 211 tons, school unit to Lyons Iron Works, Manchester, N. H.

Brookline, Mass., 200 tons, school, to Palmer Steel Co.

Chicopee, Mass., 150 tons, bridge, to Palmer Steel Co.

Winchester, Mass., 100 tons, school, to Boston Structural Steel Co., Inc.

Brockton, Mass., 100 tons, to Boston Bridge Works, Inc.

Providence, R. I., 330 tons, pier shed, to J. H. Tower Iron Co.

Spring Grove, Pa., 150 tons, bridges for Western Maryland Railroad, to McClintic-Marshall Corpn.

Wingdale, N. Y., 1400 tons, Harlem Valley Hospital, to McClintic-Marshall Corpn.

Pennsylvania Railroad, 500 tons, girders for use at Baltimore, to American Bridge Co.

Erie Railroad, 350 tons, bridge, to Pittsburgh-Des Moines Steel Co.

SOUTH AND SOUTHWEST

Raleigh, N. C., 375 tons, auditorium, to Virginia Bridge & Iron Co.

Winston-Salem, N. C., 440 tons, building for R. J. Reynolds Tobacco Co., to Virginia Bridge & Iron Co.

Wichita Falls, Tex., 110 tons, post office, to Mosher Steel & Machinery Co.

Runnels County, Tex., 240 tons, to Mosher Steel & Machinery Co.

State of Oklahoma, 500 tons, bridges, to J. B. Klein Iron & Foundry Co.

CENTRAL STATES

Wyandotte, Mich., 500 tons, highway bridge, to Whitehead & Kales Co.

Columbus, Ohio, 220 tons, grade crossing elimination for Norfolk & Western Railroad, to American Bridge Co.

Painesville, Ohio, 120 tons, County bridge at Mentor Marsh, to Guibert Steel Co.

Toledo, Ohio, 220 tons, warehouse for National Milling Co., to Massillon Bridge & Structural Co.

Kenosha, Wis., 750 tons, six overhead street crossings for Milwaukee Electric Railway & Light Co., to Worden-Allen Co., Milwaukee Structural Steel Co., C. Hennecke Co. and Kenosha Boiler & Structural Co.

Aurora, Ill., 350 tons, coach shop for Chicago, Burlington & Quincy Railroad, to an unnamed bidder.

DeKalb County, Ill., 300 tons, bridges, to Missouri Valley Bridge & Iron Co.

Peoria, Ill., 200 tons, Roosevelt High School, to Mississippi Valley Structural Steel Co.

State of Iowa, 485 tons, bridges, to Pittsburgh-Des Moines Steel Co.

McCook, Neb., 270 tons, bridges, to Pittsburgh-Des Moines Steel Co.

WESTERN STATES

Helena, Mont., 350 tons, post office, to American Bridge Co.

Colusa, Cal., 350 tons, sheet steel piling for weirs at Tisdale and Moulton's Landing, to Columbia Steel Co.

STRUCTURAL PROJECTS PENDING

Inquiries for fabricated steel work include the following:

NORTH ATLANTIC STATES

Worcester-Shrewsbury, Mass., 400 tons, State bridge.

Boston, 260 tons, Morton Street bridge.

Danby, Vt., 125 tons, crane runway.

New York, 600 tons, reconstruction of track springers on easterly lower deck of approach spans of Manhattan Bridge; bids to be opened Nov. 6 by Department of Plants and Structures.

Brooklyn, 300 tons, reconstruction of elevated structure, Myrtle and Flatbush Avenue extension, New York Rapid Transit Corpn.

Brooklyn, 750 tons, pier shed.

Buffalo, 3000 tons, grade crossing elimination for New York Central Railroad; bids to be taken in November.

Chester, Pa., 500 tons, plant alteration for Ford Motor Co.

Holmesburg, Pa., unstated tonnage, receiving building for House of Correction and incinerator housing at Home for Indigent.

Norristown, Pa., 200 tons, employees' building at State Hospital.

Selbyville, Del., 250 tons, grade and high school.

Washington, 10,000 to 12,000 tons, Supreme Court building; George A. Fuller Co., low bidder for general contract.

THE SOUTH

Raleigh, N. C., 1000 tons, highway bridge.

CENTRAL STATES

Wausau, Wis., 580 tons, Bridge Street bridge; Milwaukee Bridge Co., low bidder.

WESTERN STATES

Madison County, Idaho, 200 tons, highway bridge over Canyon Creek.

Berkeley, Cal., 1100 tons, University of California gymnasium.

Honolulu, 1000 tons, hangar and shops at Wheeler Field (Army).

FABRICATED PLATE

AWARDS

Edgewater, N. J., 800 tons, tanks, water tower, etc., for Lever Brothers, to United Dry Docks, Inc.

Ione, Cal., 200 tons, penstock at Preston Reform School, to California Corrugated Culvert Co.

PROJECTS PENDING

Alameda County, Cal., 7000 tons, 36 and 44-in. emergency water pipe line for city of San Francisco.

Seattle, 800 tons, 66-in. pipe line for city Cedar River water system.

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Reinforcing Steel

Inquiries the Largest in Many Weeks—Awards Light

NEW projects for reinforcing steel will add 12,745 tons to those pending and were the heaviest since the week of July 30. The largest jobs include 5000 tons for Government work on the Mississippi River in Illinois, 2000 tons for the Albany-Rensselaer bridge over the Hudson River and 2000 tons for grade elimination work at Buffalo. Lettings totaled only 1500 tons, compared with 15,600 tons a week ago. Awards follow:

Syracuse, N. Y., 500 tons, Syracuse Lighting Co., to a Buffalo bidder.

Philadelphia, 150 tons, foundations for Benjamin Franklin Institute, to Taylor-Davis Co.

Helena, Mont., 125 tons, city reservoir, to Caird Engineering Works.

Seattle, 200 tons, approach to Lake Union bridge, to Northwest Steel Rolling Mills.

San Mateo County, Cal., 542 tons, Bay Shore highway extension, to Soule Steel Co.

REINFORCING BARS PENDING

Inquiries for reinforcing steel bars include the following:

State of New Jersey, 300 tons, bridges and road pavement on route 36, section 1; G. Ennis Dale, Inc., Philadelphia, agent. Previously reported to Heller Brothers Co.

Yonkers, N. Y., 225 tons, high school.

New York, 520 tons, Piers 88, 90 and 92, North River, for Department of Docks.

Newark, N. J., 150 tons, city garage.

Albany, N. Y., 2000 tons, Albany-Rensselaer bridge over Hudson River; bids Nov. 10.

Buffalo, 2000 tons, grade elimination for New York Central Railroad; James Stewart & Co., Chicago, general contractor.

Philadelphia, 630 tons, boulevard construction along Schuylkill River; contract 12, requiring 480 tons to Frederick Snare Corpn., Contract 13, requiring 150 tons to Canuso & Sons, Philadelphia.

Trenton, N. J., 200 tons, building for Van Sciver Furniture Co.; William Steele & Co., general contractor.

Cleveland, 200 tons, North Woodland Road Chagrin River bridge for Cuyahoga County.

Zanesville, Ohio, 120 tons, State Street bridge over Muskingum River.

Milwaukee, 200 tons, grain elevator.

Chicago, 1000 tons, apartment hotel, Smith & Brown, engineers.

Rock Island, Ill., 5000 tons, Federal Government work on Mississippi River.

Honolulu, 500 tons, hangar and shops at Wheeler Army Air Field.

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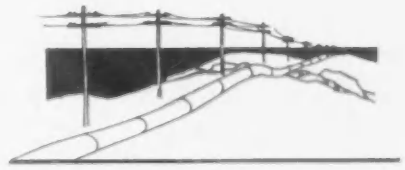

PIPE LINES

Standard Oil Co. of California, Inc., 225 Bush Street, San Francisco, has authorized construction of a pipe line from oil fields at Kettleman Hills to marine terminal at Estero Bay, Cal., to cost about $500,000.

International Utilities Corpn., 150 Broadway, New York, plans early construction of a natural gas pipe line from a point in Idaho to Vancouver, B. C., thence to Seattle, Vancouver, Wash., and Portland, Ore. Total installation will approximate 2000 miles, and will cost over $25,000,000. It is proposed to use 20-in. steel pipe for main lines. Natural gas supply will be secured from oilfields in Idaho, Montana and Wyoming, and pipe line system will be provided in that district, as well as compressor stations for booster service and other power units.

Stanolind Pipe Line Corpn. has ordered 65 miles of 8-in. line pipe, about 5000 tons, from the National Tube Co. This is in addition to the tonnage ordered by the same company about two months ago.

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Railroad Equipment

Lehigh Valley Railroad is inquiring for 15 to 20 4-8-4 locomotives.

British Trade Improves Despite Election —Luxemburg Mills Dismiss Employees

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(*By Cable*)

LONDON, ENGLAND, Oct. 26.

DESPITE the general election in Great Britain, confidence continues that the corner of the business depression has been turned.

Because of the general unsettled condition of business, the Continental Steel Cartel's directive committee will not meet as expected, but the heads of cartel groups will confer before the end of this month and formulate concrete proposals to be submitted to the next full assembly of the cartel.

British blast furnaces have substantially reduced stocks of pig iron and are preparing to blow in additional furnaces. Recently makers have not been seeking much new business, preferring to wait until after the general election.

Small tonnage sales of Cleveland pig iron have been made for export and domestic business in hematite is sustained with price advances checked by stocks on hand.

Finished steel products, especially in the heavier materials, are quiet. Canadian buyers have placed a few small orders, but other export markets are inactive and domestic consumption is restricted.

Controlled prices are unchanged, but on other products the trend is higher, especially where foreign semi-finished material is used for rerolling. Requirements of British consumers of Continental semi-finished steel are temporarily satisfied.

Soviet Union wants to place orders in Germany for close to $50,000,000, but credit is not available.

* * *

Welsh tin plate mills grant concessions in price as business declines.

* * *

Luxemburg steel mills dismissing all foreign employees.

* * *

Continental shippers object to ocean freights in gold pounds and threaten to use British and Scandinavian lines in future.

* * *

German shipbuilders face heavy loss on pound sterling contracts.

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Both French francs and gold dollars are being used for quotations by Continental sellers. German export prices have been reduced and the Stahlwerks Verband is quoting in dollars, while many exporters adhere to the French franc. Certain foreign mills in quoting to United Kingdom consumers use the current pound sterling.

Recent prices of foreign mills in the pound sterling are £3 15s. to £3 16s. ($14.87 to $15.07) for billets, £3 15s. to £3 18s. ($14.87 to $15.44) for sheet bars, £3 17s. 6d. to £3 19s. a ton (70c. to 71c. per 100 lb.) for mild steel bars, £3 18s. 6d. to £3 19s. a ton (about 71c. per 100 lb.) for shapes and £4 15s. a ton (85c. per 100 lb.) for plates, all f.o.b. Continental ports.

The Continental Wire Rod Cartel has advanced its price to United Kingdom consumers to £5 17s. 6d. ($23.17) a ton. It is generally expected that the cartel will be renewed for five years more.

British contractors expect to secure the contract for reconstruction of Alexandria harbor to cost about 2,000,000 Egyptian pounds.

Welsh tin plate mills report the market quiet, and prices are beginning to weaken. Certain mills, which have increased their output since the gold standard was abandoned, are seeking to keep their capacity fully employed and are granting concessions with the result that consumers are awaiting still greater reductions.

Certain tin plate mills have postponed resumption of operation, as current prices are insufficiently remunerative when Welsh steel is used.

Negotiations are proceeding for merger of the North Lonsdale Iron & Steel Co. in Lancashire and the Millom & Askam Hematite Iron Co. in Cumberland.

The Belgian State Railways have ordered 35,000 tons of rails and 200,000 ties for delivery in 1932 from Belgian and Luxemburg mills. The German railroads have placed 65,000 tons of rails with the Stahlwerks Verband.

Luxemburg plants are reducing

British and Continental European Export Prices f.o.b. United Kingdom Ports, Hamburg and Antwerp

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton, £ at $3.96

Ferromanganese, export	£9	0s.				$35.64		
Billets, open-hearth	5	5	to	£5	12½s.	20.79	to	$22.19
Black sheets, Japanese specifications	9	15	to	10	0	38.61	to	39.60
Tin plate, per base box (nom.)	0	13½	to	0	14½	2.67	to	2.87
						Cents a Lb.		
Steel bars, open-hearth	7	17½	to	8	7½	1.39	to	1.48
Beams, open-hearth	7	7½	to	7	17½	1.30	to	1.39
Channels, open-hearth	7	12½	to	8	2½	1.34	to	1.43
Angles, open-hearth	7	7½	to	7	17½	1.30	to	1.39
Black sheets, No. 24 gage	8	5	to	8	10	1.46	to	1.50
Galvanized sheets, No. 24 gage	9	10				1.67		

Continental Prices, f.ob. Antwerp or Hamburg

Per Metric Ton, Franc at 3.95c.

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	286 fr.	to	289 fr.	$11.30 to $11.42
Billets, Thomas	344 fr.	to	350 fr.	$13.61 to $13.85
Wire rods, low C., No. 5 B.W.G.	585	to	615	23.09 to 24.30
Rails, light	740			29.20
Black sheets, No. 31 gage, Japanese	1384	to	1476	54.68 to 58.32
				Cents a Lb.
Steel bars, merchant	381	to	383	0.69 to 0.70
Beams, Thomas, British standard (nominal)	381	to	387	0.69 to 0.70
Channels Thomas, American sections	689	to	701	1.24 to 1.26
Angles, Thomas, 4-in. and larger, over ⅜-in. thick	378	to	384	0.68 to 0.69
Angles, Thomas, 3-in.	387	to	393	0.69 to 0.70
Hoops and strip steel over 6-in. base	492	to	510	0.90 to 0.92
Wire, plain, No. 8 gage	615	to	624	1.09 to 1.10
Wire, barbed, 4-pt. No. 12 B.W.G.	1045			1.87

their output and dismissing foreign employees. Their September output was 172,000 tons of pig iron and 175,000 tons of raw steel with 25 blast furnaces active at the end of the month. The Acieries Reunies de Burbach-Eich-Dudelange has suspended all work on expansion of the Burbacher Hütte.

Saar output in September was 121,000 tons of pig iron and 128,000 tons of raw steel.

Czechoslovakian production in September was 99,000 tons of pig iron and 137,000 tons of raw steel.

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Work on South African Mill to Be Hastened

(By Cable)

LONDON, ENGLAND, Oct. 26.—A recent report that construction of the South African steel plant might be abandoned as too costly is denied by the Government of South Africa, which states its intention to hasten construction of the new steel mills.

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German Shippers Object to Gold Pound Freights

HAMBURG, GERMANY, Oct. 21.—German manufacturers generally are vigorously opposing the efforts of shipping lines to obtain payment of freight rates in the gold pound sterling. As German producers have sold their products recently on a c.i.f. basis in paper pounds sterling, necessity of paying the freight rate in gold pounds represents a considerable loss. British and Scandinavian shipping lines are accepting payment of freight rates in paper pounds, so that German and other Continental shippers are threatening to use only these lines in the future, unless competing shipping companies accept the same rates of payment.

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More Iron Surfaced Roads for England

LONDON, ENGLAND, Oct. 18.—The surfacing of a section of highway with specially designed iron plates has been proposed by the Stanton Iron Works, Worcester. If accepted by the local government, serviceability of this road surface will be tested, and if not satisfactory the highway will be remade by the company. It is estimated that the cost of this iron surface on a section of Lowesmoor Place, Worcester, the proposed site of the experiment, will be £1200 for 1200 sq. yd., or about $3.96 a sq. yd.

In addition to a section of highway in Stratford, a suburb of London, surfaced with iron plates by Iron Roads, Ltd., described in THE IRON AGE, Oct. 8, another iron surfaced road has been experimentally constructed in Nottingham.

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American Wire Rods Sold in Japan

YOKOHAMA, JAPAN, Sept 30.—Purchases of American wire rods by Japanese consumers have been stimulated by a reduction of $1 a ton in the c.i.f. price, while the European cartel has advanced its price 2s. (40c.) a ton. Since this reduction by the American sellers, the price has been about $28.50 a ton, c.i.f., and on desirable orders buyers suggest that concessions to $28.15 a ton have been obtainable. As a result, contracts for 1200 to 1300 tons have been concluded recently. This development has caused some irregularity in the Japanese market and is a temporary obstacle to efforts by domestic makers to stabilize prices.

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German Alloy Steel Research Curtailed

DUSSELDORF, GERMANY, Oct. 20.—Economic conditions have forced the German alloy steel industry to curtail drastically the numerous experiments being made in the development of new alloys at the Versuchsanstalt (Research Institute).

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Steel Theater Seats to Be Made in Sheffield

SHEFFIELD, ENGLAND, Oct. 16.—Two new industries have come to Sheffield, and in future metal theater seats and vacuum cleaners will be manufactured here. The theater seats, developed by two Sheffield men, will have tubular steel frames, either chromium plated or of stainless steel. The vacuum cleaners will be made by Sheffield Steel Products, Ltd., for a company which hitherto has placed its orders abroad.

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German Shipbuilders Lose by Depreciated Pound

HAMBURG, GERMANY, Oct. 21.—Practically all ships under construction in German shipyards have been sold in pounds sterling, and, unless the builders are able to secure payment in gold pounds, losses will be exceedingly heavy. In fact, two yards may be forced to close if paid in the paper pound sterling at the present level. The change in sterling values is diverting most of the ship repair business to British yards, and German builders are experiencing a sharp decline in new orders.

Germany Unable to Take Large Soviet Orders

(By Cable)

LONDON, ENGLAND, Oct. 26.—Further German business with the Soviet Union has been suspended by lack of sufficient credit facilities. The Soviet is prepared to place steel and equipment orders for 200,000,000 m. ($47,600,000), but German sellers are unable to exceed the present credit guarantee limit of 700,000,000 m. ($166,000,000), a large part of which has been used. Meanwhile, Russia is understood to be negotiating with Saar mills to place a 20,000,000 fr. ($786,000) order for ingots and rolled products. Construction has been started by the Soviet on the Nikopol tube mill, which is to have an annual capacity of 450,000 tons.

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Exports of Machinery in Containers Growing

HAMBURG, GERMANY, Oct. 21.—German shipments of machine tools and other equipment in containers is expanding rapidly, especially to Great Britain and the Scandinavian countries, and recently certain machine tools have been shipped in containers to the United States. The German railroads have reduced their rates 10 to 15 per cent on goods shipped for export in containers.

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European Rail Reduction Brings in More Business

BERLIN, GERMANY, Oct. 20.—The decision of the International Rail Makers' Association to reduce its export price from £6 10s. to £5 17s. 6d. a ton, f.o.b., Continental ports, and to adopt the gold pound sterling as a basis, is reported by rail mills to be stimulating foreign purchases. Previous refusal of the association to lower the price had developed considerable opposition in foreign markets, which were seeking to buy rails from non-members of the association. Inquiries for more than 120,000 tons of rails, however, are now being negotiated with South Africa, China, Siam, Mesopotamia, Egypt and other foreign countries.

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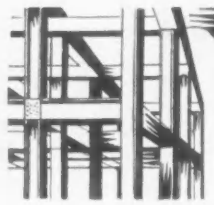
Aircraft Exports Increase

HAMBURG, GERMANY, Oct. 21.—Germany's exports of aircraft have shown a remarkable increase this year, totaling 6,070,000 m. ($1,408,000) in the first seven months, compared with 2,600,000 m. ($603,200) in the same period of 1930. France and the British dominions are Germany's best aircraft customers.



PLANT EXPANSION AND EQUIPMENT BUYING

Machine Tool Buying Continues Sluggish

Only Important Inquiry of the Week Is for 42 Used Machines—October Sales Volume Small

MACHINE tool business throughout October has been in small volume, probably not exceeding the poor totals of September, which was one of the worst months the machine tool industry has experienced in years.

While there are some minor signs of improvement, such as a better demand for repair parts, the outlook for tool buying has not improved.

One of the largest inquiries of the week was for used tools, the Hercules Motor Co., Canton, Ohio, having asked for prices on 42 machines, including 34 for drilling operations. The Lycoming Mfg. Co., Williamsport, Pa., has continued to award orders against its requirements for motor work, its recent orders including turret lathes, milling machines and drilling machines.

In the Chicago district a few inquiries are coming from farm implement manufacturers, who are resuming production on a moderate scale.

In view of the continued sluggishness of general business, the machine tool industry does not look for important change in the situation until early in 1932.

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New York

Machine tool sellers continue to receive a substantial number of orders for repair parts, suggested to be an indication of renewed activity in certain plants. Buying of new tools, however, is generally limited to one or two units for special purposes. For example, a Dunkirk, N. Y., plant making equipment used by the oil industry, a car builder which received a sizable contract for cars for the new subway in New York, a Brooklyn seller of strip steel, two electrical equipment manufacturers and a printing machinery company have all bought one or two tools in the past week. The Lycoming Mfg. Co., Williamsport, Pa., has awarded turret lathes, milling machines and drills, representing about half its order for $150,000 worth of machine tool equipment. The Brooklyn Navy Yard will open bids Nov. 10 on two 24-in. lathes, which appeared on a list of tools some weeks ago, but were not awarded at that time.

Chicago

Machine tool dealers in this district believe they sense a slightly better feeling on the part of users. However, this change is not reflected in orders or inquiries. Farm implement manufacturers have made a moderate step upward in production schedules and some are finding need for new machine tool equipment. The Studebaker Corpn., South Bend, Ind., is continuing its study of replacements and still remains a factor in the market.

Cincinnati

A slight improvement in sales of light machinery this month has been offset by the sluggishness of demand for heavy tools. Fresh bookings continue few and inquiries are light.

Milwaukee

While prospects for improvement in machine-tool demand continue favorable, the volume of business is negligible. The shop modernization movement remains restricted by problems of finance and the effects of an extended period of profitless operation. The employment curve of metal-working shops is a straight line at this time, additions to payrolls in some plants being offset by decreases in others. The time seems to be close at hand, however, when production of many commodities must be resumed in response to the depletion of supplies.

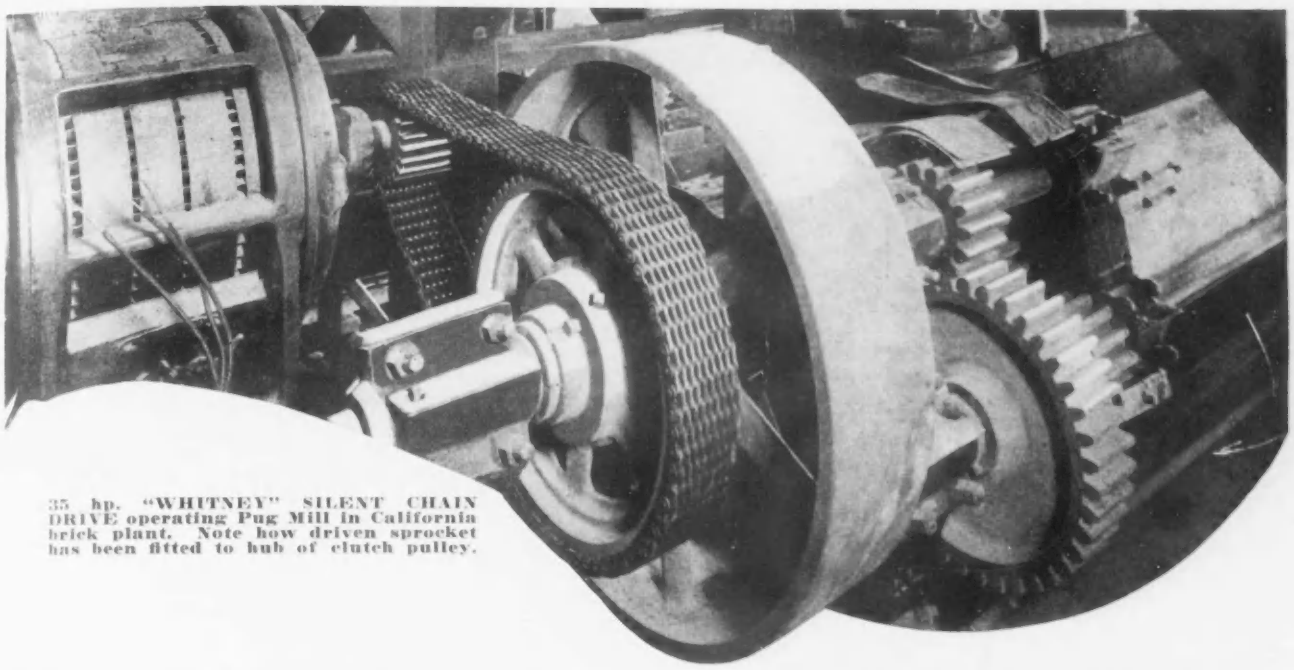
Pittsburgh

Reports of the machine tool trade in this district are still concerned more with expectancies than with actual orders. Aggregate business placed thus far this month shows little improvement over that of September, which was the poorest month in years. However, inquiry has shown some additional life recently. Most of this prospective business is not for immediate placing and if orders result they are not expected until after the first of the year when dealers look for a marked pick-up in business generally.

No large orders from the steel mills for heavy equipment are reported, but here also inquiry is encouraging. A number of companies are figuring on plans for reducing costs of steel making and rolling, but reports of capacity expansion programs are not given much credence.

Cleveland

An inquiry for 42 used machines has been issued by the Hercules Motor Co., Canton, Ohio. The list includes 34 drilling machines, six lathes and several boring, milling and other types of machines. Orders were light the past week and, with the exception of the one list, there was little inquiry. Sales included two turret lathes purchased by the Deming Co., Salem, Ohio. There was little activity in steel plant equipment, although a Chicago district mill purchased 70 annealing cars.



35 hp. "WHITNEY" SILENT CHAIN DRIVE operating Pug Mill in California brick plant. Note how driven sprocket has been fitted to hub of clutch pulley.

You Can Depend on WHITNEY Silent Chain Drives

Production machinery does not pay dividends if the motor drive is unreliable.

WHITNEY Silent Chains provide a positive drive without slippage. They are satisfactorily quiet in operation and have made unusual records for long life.

Wherever chains are adaptable WHITNEY Chains will insure a compact, economical power drive.

Call our nearest office for free engineering service.

WHITNEY CHAIN DRIVES

THE WHITNEY MFG. COMPANY

HARTFORD, CONNECTICUT

ATLANTA, GA.
Cox Foundry & Machine Co.,
985 Cox Avenue, S. W.

BOSTON
The Whitney Mfg. Co.,
250 Stuart Street

BUFFALO
Potter & Dugan, Inc., Agents,
Court & Wilkeson Sts.

Bickford & Francis Belting Co.,
Distributors—Pearl Street

CHICAGO
The Whitney Mfg. Co.,
549 W. Washington Blvd.

CLEVELAND
The Whitney Mfg. Co.,
1213 W. Third Street

Smith Power Trans. Co.,
Penton Building

DALLAS
O. H. Holman Co.,
111 North Race St.

DENVER, COLO.
Colorado Gear Mfg. Co.,
1361-71 S. Broadway

Sales and Engineering Offices:

DETROIT
The Whitney Mfg. Co.,
2-240 General Motors Bldg.

GASTONIA, N. C.
Precision Gear & Machine Co.,
701 E. Franklin Street

LOS ANGELES
A. H. Coates Co.,
2011 Sante Fe Ave.

NEW YORK
L. C. Biglow & Co., Inc
250 W. 54th Street

PHILADELPHIA
The Whitney Mfg. Co.,
133 S. 36th Street

Phila. Gear Works,
Erie Avenue & G Street

PITTSBURGH
Pittsburgh Gear & Machine Co.,
27th & Smallman Streets

PORTLAND, ORE.
Portland Iron Works,
495 Northrup Street

SAN FRANCISCO
A. H. Coates Co.,
615 Howard Street

SEATTLE
Berg-Evans Chain Co.,
1743 First Avenue, So.

SYRACUSE
George McPherson,
201 Norwood Ave.

New York

SIGNAL Supply Officer, Army Department, Army Base, Brooklyn, will receive bids until Nov. 2 for pliers, U-bolts and other supplies; until Nov. 10 for 1700 mast sections.

Board of Education, Park Avenue and Fifty-ninth Street, New York, has awarded general contract to Royal Rice Co., Inc., 130 East Fifty-seventh Street, for four-story vocational and continuation school at Richmond, S. I., 180 x 220 ft., at price of $726,000; with equipment, unit will cost more than $1,000,000. W. C. Martin, Flatbush Avenue Extension and Concord Street, Brooklyn, is school architect.

Clayton Co., 427 West Forty-second Street, New York, manufacturer of automobile bodies, has leased building of Checker Cab Corpn. at 14-16 West End Avenue for new works, including repair shop.

American Aviator Propeller Corpn., New York, care of Francis Rogers, 85-53 164th Street, Queens, L. I., recently organized by Mr. Rogers and associates with capital of $125,000, plans operation of factory for manufacture of aircraft propellers. Frederick Nagle, 103-40 124th Street, Queens, is interested in company.

Albany Port District Commission, 74 Chapel Street, Albany, N. Y., has awarded general contract to James Stewart Corpn., 343 South Dearborn Street, Chicago, for grain elevator on waterfront, with facilities for storage and distribution of package goods, to cost $1,500,000 with equipment. Cargill Elevator Co., Minneapolis, Minn., will operate plant under lease.

Westchester County Sanitary Commission, White Plains, N. Y., James Berg, secretary, has plans for water sterilization plant at Saunders Dock, Yonkers, to cost $500,000 with power and other machinery, and expects to begin work before close of year.

International Projector Corpn., 92 Gold Street, New York, manufacturer of motion picture machinery, a division of General Theaters Equipment, Inc., will carry out expansion for manufacture of new equipment, including a portable sound and motion picture projector machine, a special projector unit and pocket camera. Company is placing output on 54-hr. week schedule, with three nights overtime each week.

Naval Supply Depot, Brooklyn, N. Y., Department of Supplies and Accounts, is asking bids until Nov. 3 for machine tools, bolts, nuts, electric cable, valves and other equipment.

E. O. Norris, 35 Hobart Avenue, Port Chester, N. Y., and associates have organized Norris Painting Machinery Corpn., with capital of $25,000, and plan operation of factory for manufacture of machinery and equipment used for painting. A. J. Norris, 137 East Elm Street, Greenwich, Conn., is interested in company.

Armory Board, New York, care of Charles B. Meyers, 31 Union Square, New York, architect, plans installation of forge, wood-working shop, garage and repair shop in connection with new armory for 104th Field Artillery at Jamaica, L. I., to cost over $500,000.

American Cyanamid Co., 535 Fifth Avenue, New York, has renewed option on 2100 acres near Kingsport, Tenn., where limestone deposits have been located, and contemplates erection of electrochemical works to cost over $10,000,000 with equipment. Holston River Power Co., an affiliated organization, has applied for permission to build dam for power development for chemical plant.

Board of Education, West Orange, N. J., plans installation of manual training equipment in new three-story and basement junior high school to cost close to $500,000, for which bids are being asked on general contract until Nov. 10. Hacker & Hacker 201 Main Street, Fort Lee, N. J., are architects.

Culbert Pipe & Fittings Co., 180 Eighth Street, Jersey City, N. J., has rejected bids recently received for one-story storage and distributing plant, 148 x 200 ft., with pipe-cutting, fitting and other departments, to cost over $45,000 with equipment. Revised plans will be prepared and new bids asked. Mahnken & Schultz, 256 Summit Avenue, Union City, N. J., are architects.

Globe Oil Burner Co., Chester, N. J., recently organized by John K. Meyer, Chester, and associates, with capital of $125,000, plans operation of factory for manufacture of oil burners and oil-burning equipment. Walter R. Morgan, Naughright, N. J., is interested in company.

Jersey City Coal Co., 374 Newark Avenue, Jersey City, N. J., will soon begin erection of new coal pocket with loading and other equipment. William Neuman, 26 Journal Square, is architect.

Annandale Graphite Corpn., Annandale, N. J., is carrying out expansion and improvements at mines, preparatory to resumption of operations at plant, and will install new hoisting, conveying and other equipment. Harold D. Tonkins, Clinton, N. J., is general manager.

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Philadelphia

ONE-STORY building on Rising Sun Avenue, Philadelphia, has been leased for expansion by Uhlmann Mfg. Co., American and Bristol Streets, manufacturer of milk and dairy plant machinery and parts.

South Chester Terminal & Warehouse Co., Chester, Pa., affiliated with South Chester Tube Co., has applied for permission to operate marine terminal with warehouse on Delaware River waterfront. Company will take over present terminal property of Tube company, and will install marine railway and equipment, mechanical-handling equipment, conveying, loading and other machinery. Project will be financed by South Chester Tube Co., with issuance of stock totaling $1,000,000. A. J. Tucker, vice-president and traffic manager of Tube organization, will be head of terminal company.

Thomas Gucker, Jr., 57 Summitt Avenue, Philadelphia, and associates have organized Gucker Brothers, Inc., to operate plant for manufacture of electrical apparatus, panel boards, junction boxes, etc. George V. Strong, 34 West Southampton Avenue, is interested in new company.

Sun Oil Co., 1608 Walnut Street, Philadelphia, has taken out a permit to build new bulk oil storage and distributing plant at Huntington, W. Va., to cost about $50,000 with equipment.

William J. Ellis, commissioner, Institutions and Agencies, State Office Building, Trenton, N. J., is asking bids until Nov. 4 for new industrial building at New Jersey Reformatory, Rahway. Plans at office of Division of Architecture and Construction, address noted.

State Purchase Commissioner, E. J. Quigley, State House, Trenton, N. J., is asking bids until Nov. 12 for quantity of steel automobile license tags for coming year.

Viscose Co. of America, Inc., Marcus Hook, Pa., has plans for new steam power house, to use pulverized coal, at rayon mill at Parkersburg, W. Va., to cost over $40,000. Ballinger Co., Twelfth and Chestnut Streets, Philadelphia, is architect and engineer.

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South Atlantic

OFFICIALS of Crown Cork & Seal Co., Eastern Avenue and Kresson Street, Baltimore, manufacturer of metal bottle caps, bottle-capping machines, parts, etc., has secured interest in Western Stopper Co., San Francisco, manufacturer of kindred products, and will operate as a Pacific Coast subsidiary. Extensions in factory branches of affiliated organizations are planned.

Heidelbach Co., 720 Frederick Avenue, Catonsville, Baltimore, grocer, has plans for two-story storage and distributing plant, with service and garage unit, 50 x 100 ft. Irvin B. Spittel, 4106 Frederick Avenue, is architect.

Richard W. Judick, 132 Willard Street, Baltimore, manufacturer of toys, has organized Willard Toy Mfg. Co. with capital of $25,000, to take over and expand present plant and business, including manufacture of metal toy specialties, etc. Merle E. Reed, Baltimore, is interested in new company.

Bureau of Yards and Docks, Washington, has awarded general contract to H. W. Cord Co., Inc., 1003 K Street, N. W., for two-story addition to naval engineering experiment building at navy yard, Annapolis, Md., to cost about $60,000.

Champion Fibre Co., Canton, N. C., manufacturer of fibre, corrugated board and paper containers, boxes, etc., sheet products and allied specialties, will carry out expansion and improvements at mill, including additional machinery, to cost about $1,000,000. Three one-story extensions will be built to house new equipment. Reuben W. Robertson is president and general manager.

Veterans' Administration, Arlington Building, Washington, will receive bids until Nov. 10 for equipment for veterans' administration hospital at Columbia, S. C., including steel water tower and tank, refrigerating and ice-manufacturing plant, electrical distributing system, etc. Plans at office of Construction Service of Administration, address noted.

Baltimore Paint & Color Works, 150 Calverton Road, South Baltimore, manufacturer of paints, varnishes, etc., has plans for a one-story addition, 40 x 100 ft. Mixing, filling and other equipment will be installed.

Williams Machine & Welding Works, Thomasville, Ga., is planning to rebuild part of plant recently destroyed by fire.

Inland Waterways Corpn., Munitions Building, Washington, will receive bids until Nov. 16 for main engines and auxiliaries for twin screw Diesel engine towboats, proposals to be considered for one or two such boats. Units will cost about $200,000 each.

Sanford Coca-Cola Bottling Co., Sanford, N. C., has awarded general contract to Joseph W. Stout Co., Sanford, for two-story plant, to include installation of

170 feet
is a lot of drain pipe

...and to replace it twice in ten years is a lot of expense

NOW DURIRON *IS BEING PUT IN FOR PERMANENCE*

Here is a true story from IRON AGE headquarters of what happened to an acid drain line that was not meant to carry acid at all.

Look at the picture again and see the toll this pipe paid to corrosion. It was good pipe, it would have served well in its place, but it was not made to do this job.

Five years ago the pipe line was torn out from THE IRON AGE building and replaced by similar pipe. And now *this* pipe has had to be replaced—but by *Duriron Acid-resistant Pipe.* You can get an idea of the expense, time and grief that would have been saved had Duriron been installed in the first place.

Duriron is corrosion-resistant *inside, outside and all the way through,* and hence *needs no* coating or lining. It resists indefinitely practically every waste involving corrosives and therefore its first cost is the only cost.

For drain lines from pickling tanks, or for lines carrying pickling and plating solutions, avoid unnecessary pipe expense by taking advantage of the *economy through permanence* offered by Duriron Corrosion-resistant Pipe.

THE DURIRON COMPANY, INC.

438 N. Findlay St., Dayton, Ohio

DURIRON

automatic bottling machinery, conveying and other equipment, to cost over $45,000.

American Oil Co., Valley Park Drive, Greensboro, N. C., has awarded general contract to George W. Kane, Greensboro, for a bulk oil storage and distributing plant, to cost about $30,000 with equipment. A pumping plant will be installed.

General Purchasing Officer, Panama Canal, Washington, is asking bids until Nov. 10 for steel drills, files, forges, turnbuckles, blowers, cable, wire, tieplates, pipe joints and other mechanical and electrical equipment.

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Cincinnati

CONTRACT has been let by Cincinnati Galvanizing Co., 4900 Spring Grove Avenue, Cincinnati, to Theodore Hirschfeld, 1040 Straight Street, for two-story addition, including improvements in present plant. Rendigs, Panzer & Martin, 519 Main Street, are architects.

Frankfort Industrial Foundation, Frankfort, Ky., has awarded general contract to Howell & Coin, Frankfort, for one-story plant unit to cost about $50,000, exclusive of equipment. Leo L. Aberwarth & Son, Frankfort, are architects.

Board of Education, Cookeville, Tenn., contemplates installation of manual training equipment in new central high school to cost about $175,000, for which general contract has been let to Foster-Creighton Co., Fourth and First National Bank Building, Nashville, Tenn.

Contracting Officer, Wright Field, Dayton, Ohio, is asking bids until Nov. 3 for a motor-generator set and for three battery charging outfits; until Nov. 9 for 40 bomb rack control assemblies and 50 bomb rack tripper assemblies.

Fisher Brass, Inc., Marysville, Ohio, care of Morris Lopper 44 East Broad Street, Columbus, Ohio, recently organized with capital of $100,000 and 25,000 shares of common stock, no par value, plans operation of works for production of brass, bronze and kindred metal products.

Common Council, Greeneville, Tenn., contemplates establishment of municipal airport, with hangar, repair and reconditioning shop and other field units.

Gooch-Edenton Hardware Co., Jackson, Tenn., plans rebuilding part of storage and distributing plant recently destroyed by fire, with loss reported over $75,000.

Tennessee Electric Power Co., Chattanooga, Tenn., plans installation of electric-operated pumping machinery and auxiliary equipment in water plant at Winchester, Tenn., to cost close to $25,000.

Memphis Oxy-Acetylene Co., Memphis, Tenn., recently organized by Thomas A. Evans, Bank of Commerce Building, and associates with capital of $100,000, plans operation of welding plant.

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New England

BIDS will be received by Transit Department, 1 Beacon Street, Boston, until Nov. 3 for 28 mechanical fans and motors for Boston and East Boston ventilation buildings of traffic tunnel. Ernest R. Springer is chief engineer.

Mystic Ice Co., Mystic, Conn., plans construction of two coal pockets, with conveying, loading and other equipment.

Western Cartridge Co., East Alton, Ill., has purchased plant and assets of Winchester Repeating Arms Co., New Haven, Conn., manufacturer of rifles and firearms, etc., now in receivership. Purchasing company will continue Winchester company as an affiliated organization.

C. J. Royle and T. G. Barnes, Ossining, N. Y., have organized Winsted Insulated Wire Co., Inc., with capital of $60,000, to operate plant at or near Winsted, Conn., for manufacture of insulated wire products, enameled wire, etc.

Perin-Walsh Co., 1540 Columbus Avenue, Boston, manufacturer of motor truck bodies and equipment, is planning expansion and contemplates removal of works to new location, where about double present floor space will be provided.

Rocky Hill Incorporated District, Rocky Hill, Conn., will receive bids until Nov. 2 for one steel standpipe, 30 ft. diameter and 85 ft. high. Plans and specifications at office of manager and chief engineer, water bureau, metropolitan district, 1026 Main Street.

Saco-Lowell Co., Saco, Me., manufacturer of textile machinery, is considering removal of branch plant at Newton Upper Falls, Mass., to Saco, and concentration of production at last-noted works. Branch plant is given over to foundry and carding machinery department and transfer to Saco will cost about $300,000, including increased facilities at new location.

Metropolitan Body Co., Bridgeport, Conn., which will build special mail truck bodies for Post Office Department, has leased part of plant of former Locomobile Co. of America, Bridgeport.

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Chicago

EXPANSION and improvements have been authorized by Standard Oil Co. of Indiana, 910 South Michigan Avenue, Chicago, at Casper, Wyo., including new cracking unit for gasoline production with daily charging capacity of about 6500 bbl. and other machinery, also increase in storage and distributing facilities. Entire work will cost over $350,000.

Karr Range Co., Belleville, Ill., is planning to rebuild part of enameling plant recently destroyed by fire, with loss about $35,000 including equipment.

State Department of Administration and Finance, State Capitol, St. Paul, Minn., is planning installation of additional equipment at power plant at State Reformatory, St. Cloud, Minn., including 200-kw. generator unit and accessories. Pillsbury Engineering Co., 1200 Second Avenue, Minneapolis, is engineer.

Superintendent, Wahpeton Indian School, Wahpeton, N. D., is asking bids until Nov. 3 for one 20-in. motor-driven drill press, two motor-driven engine lathes, and one motor-driven hacksaw; also for one air compressor, one hoist and trolley, one electric drill, wrenches, spray outfit and other equipment.

Supreme Radiator & Body Co., 611 Clinton Street, Joliet, Ill., has been organized by Morris Weiner and Edward S. Schneider, to take over works and business of company of similar name, and will carry out expansion.

Board of Education, Charles City, Iowa, plans installation of manual training equipment in new three-story junior and senior high school to cost close to $300,000, for which general contract has been let to Askov Construction Co., Askov, Minn. Jacobson & Jacobson, Wesley Temple Building, Minneapolis, Minn., are architects.

Officials of Q. R. S.-Devry Corpn., 342 North Michigan Avenue, Chicago, manufacturer of radio tubes, electric lighting equipment, etc., have organized Devry Corpn., a subsidiary, to take over and operate camera and affiliated division of parent organization, and to carry out development in that line. Parent company has approved increase in capital from 400,000 to 500,000 shares of stock, no par value, portion of proceeds to be used for expansion. Joseph B. Kleckner is president.

Northwestern Public Service Co., Huron, S. D., will issue bonds in amount of $300,000 and preferred stock totaling $175,000, part of proceeds to be used for expansion and improvements in power plants and system.

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Buffalo

BOARD OF EDUCATION, City Hall, Syracuse, N. Y., plans manual training department in new three-story and basement junior high school on Grant Boulevard, for which general contract has been let to McLennan Co., 363 Buckingham Road, to cost close to $700,000. W. W. Cronin, State Tower Building, is architect and engineer.

International Salt Co., Myers, N. Y., plans rebuilding part of plant recently destroyed by fire, with loss estimated at $70,000, including equipment. Headquarters are at 475 Fifth Avenue, New York.

H. & N. Mfg. Corpn., Binghamton, N. Y., recently organized by Moses Hider, 48 Cresmont Road, and Nicholas Nicholas, 38 Spring Forest Avenue, with capital of $100,000, plan operation of factory for manufacture of metal products and mechanical equipment.

D. S. and D. D. Robinson, Nunda, N. Y., have organized Adnun Engineering & Mfg. Co., with capital of $20,000, to operate plant for manufacture of small tools and kindred mechanical equipment.

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Pittsburgh

FORMER plant of Pittsburgh Lamp, Brass & Glass Co., Jeannette, Pa., consisting of 10-acre tract and group of eight buildings has been acquired for expansion by Homer Miller, Jeannette, manufacturer of toys, who will remove to new location.

Owens-Illinois Glass Co., 965 Wall Street, Toledo, Ohio, is planning expansion and improvements at plant at Fairmont, W. Va., including one-story unit for concentration of all mechanical departments, installation of electric lehrs, to replace gas-operated units, stokers, coal bunkers and other equipment, to cost over $85,000. Company has acquired plants of Mid-West Box Co., Chicago, at Huntington and Charleston, W. Va., specializing in production of corrugated boxes and containers, and will operate for container production for glass products.

John A. Elliott, Patterson Heights, Beaver Falls, Pa., and associates have organized Micro-Meter Corpn., Rochester, Pa., with capital of $50,000, to operate plant for manufacture of measuring devices, gages and equipment for gasoline, oils, etc. Lyon McCandless, Patterson

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CARNEGIE STEEL COMPANY - PITTSBURGH
Subsidiary of United States Steel Corporation
CARNEGIE

Heights, Beaver Falls, is interested in new company.

Standard Stoker Co., Inc., 1701 Gaskel Avenue, Erie, Pa., manufacturer of stokers, parts, etc., is planning one-story addition, 35 x 190 ft., for storage and distribution, to cost about $30,000 with equipment. F. C. Pickard is general manager.

Elk Mining Co., Brandy Camp, Elk County, Pa., is planning to rebuild power house and coal tipple at local mining properties, recently destroyed by fire.

Erie Steel Barrel Co., Erie, Pa., will develop close to normal output with full working quota. Company has recently secured order from Standard Oil Co. of New Jersey, New York, for 90,000 steel barrels and other sizable contracts.

Crew-Levick Co., Elverson Building, Philadelphia, oil products, plans rebuilding pumping plant at Rouseville, Pa., recently destroyed by fire. New machinery will be installed.

Westinghouse Electric & Mfg. Co., East Pittsburgh, will concentrate manufacture of refrigerator cabinets at its Mansfield works, beginning Jan. 1. According to C. E. Allen, commercial vice-president of company, chief factors leading to selection of Mansfield plant for this activity include proximity of Mansfield to center of distribution, availability of skilled labor and high standard of living conditions in that locality. E. M. Olin, works manager, stated that with a large part of cabinets for all Westinghouse requirements to be produced at Mansfield, plant will be operated at capacity for entire year of 1932.

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Milwaukee

ORGANIZATION of K-P Seat Co., Milwaukee, to manufacture spring suspension seats for motor trucks and tractors, is announced. Production is being started in plant of Kopplin Cushion Spring Co., 512 West Cherry Street, manufacturer of automobile seating and upholstery. Paul O. Kopplin, president of spring company, is head of new organization, with Charles H. Palmer, vice-president, and Charles J. Rietz, secretary and treasurer.

Bond issue of $95,000 for municipal garbage incinerator at Kenosha, Wis., failed of approval at special election and project will be indefinitely postponed.

Marathon Paper Mills Co., Wausau, Wis., has placed contracts for factory addition, 64 x 70 ft., one-story and basement, to cost about $40,000 with equipment.

Village of Verona, Dane County, Wis., has approved bond issues of $65,000 for construction of waterworks and sewage disposal plant and system. Plans are by W. G. Kirchhoffer, consulting engineer, 22 North Carroll Street, Madison Wis.; Ralph L. Hinrichs is village clerk.

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Detroit

PLANS have been approved by Edison Sault Electric Co., Sault Ste. Marie, Mich., for an addition to hydroelectric generating plant on St. Mary's River, with installation of equipment to double present capacity. Program will include more than 125 miles of transmission lines for service at St. Ignace and Manistique, with power substation facilities. Entire project will cost over $1,000,000. Company has acquired St. Ignace Public Service Co. and Manistique Light & Power Co. and will consolidate with organization. It is a subsidiary of American State Public Service Co., 100 West Monroe Street, Chicago.

J. W. Wells Lumber Co., Menominee, Mich., has work under way on one-story mill, L-shaped, 164 x 173 ft., for production of hardwood flooring, to replace a unit recently destroyed by fire. Flooring machines, saws and other equipment will be installed to develop capacity of 45,000 ft. a day. Plant will cost over $65,000 with equipment.

Board of Trustees, Michigan State College, East Lansing, Mich., has awarded general contract to Reniger Construction Co., Lansing, for addition to engineering school, to cost over $100,000, including equipment.

Board of Works, Detroit, is considering extensions and improvements in Fairview pumping plant for municipal waterworks, to cost over $250,000 with equipment, including electric-operated pumping machinery, etc.

Sparks-Withington Co., Jackson, Mich., manufacturer of radio equipment automobile horns and equipment, etc., is arranging for production of electric refrigerators. Branch plant at Michigan Center, Mich., will be utilized for that purpose. It is proposed to have plant ready for service early in January.

Norge Corpn., 7601 Central Avenue, Detroit, manufacturer of electric refrigeration equipment, affiliated with Borg-Warner Corpn., Chicago, is planning expansion at plant of Alaska Refrigerator Co., Muskegon, Mich., recently acquired.

Hupp Motor Car Corpn., 3641 East Milwaukee Street, Detroit, is arranging to concentrate body manufacture at two plants in Cleveland and will carry out expansion for that purpose. Certain equipment will be removed from Detroit works to that location, with installation of new machinery for larger capacity.

Common Council, Lowell, Mich., is considering extensions and improvements in municipal electric light and power plant, including installation of a 600-hp. Diesel engine unit and auxiliary equipment, to cost about $50,000.

R. J. Tower Iron Works, Inc., Greenville, Mich., has filed notice of company dissolution under State laws.

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Cleveland

CONTRACT has been let by Grasselli Chemical Co., Guardian Building, Cleveland, to Lundoff-Bicknell Co., B. F. Keith Building, for a three-story and basement addition, 31 x 54 ft., to cost close to $65,000 with equipment.

Hercules Motor Co., Canton, Ohio, is inquiring for following used tools:

Six 28-in. and 19 24-in. plain sliding head drilling machines.
One sensitive two-spindle drilling machine.
One two-spindle opposed head drilling machine, 36 in. between heads.
One three-spindle in line, 6½-in. centers, 1-in. drilling machine.
Two eight-spindle in line, 1¾-in. centers, 9/16-in. drilling machine; also one 8-spindle multiple, 10 x 18 in. head; one 18-spindle multiple, 12 x 20 in. head; one 25-spindle multiple, 24 x 24 in. head, and one 27-spindle, multiple, 24 x 24 in. head, ¾-in. capacity drilling machines.
Six 18-in. x 4-ft. lathes.
Two 4-spindle, 3½-in. centers, boring machines.
One small power-feed milling machine.
One No. 2 and three No. 3 horizontal plain milling machines.
Two No. 3 vertical milling machines.
One rotary milling machine.
One tapping machine.
One honing machine.

McKay Iron Works Co., Cleveland, has been organized to take over and expand company of same name, with plant at 1710 Clarkstone Road. New company is headed by W. S. Fitzgerald and R. M. Tillotson.

Thomas F. Logan and associates have leased plant of United States Malleable Iron Co., Wauseon, Ohio, and will operate majority of works for a foundry. An option has been taken to purchase property in a year. Charles Brunning will be associated with new organization.

Cleveland Friction Joint Co., Beechwood, Ohio, care of H. E. Parsons, 1446 Standard Bank Building, Cleveland, recently organized by Mr. Parsons and associates, plans operation of factory for production of friction joints and kindred specialties. Henry J. Williams, Cleveland, is interested in new organization.

Weatherhead Co., 708 Frankfort Avenue, N. W., Cleveland, manufacturer of automatic screw machine parts, automotive specialties, etc., is operating close to normal with regular working force. Company has developed number of new products, including faucet stems, hydraulic automobile brake hose, etc. Sales in September showed an increase of 11 per cent over corresponding month of a year ago.

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St. Louis

PLANS are under way by Standard Oil Co. of Kansas, Neodesha, Kan., for extensions and improvements in local oil refinery, including equipment for production of new gasoline, to cost over $200,000 with machinery.

Kroger Grocery & Baking Co., 35 East Seventh Street, Cincinnati, has engaged Emil H. Niemann, 3816 Shaw Avenue, St. Louis, architect, to prepare plans for plant at 1311 South Thirty-ninth Street, St. Louis, with traveling ovens, mixing machinery, conveying and other equipment. An automobile service, repair and garage building will be built, also boiler plant. Entire project will cost $750,000, including equipment. P. F. Christy, company headquarters, Cincinnati, is architect.

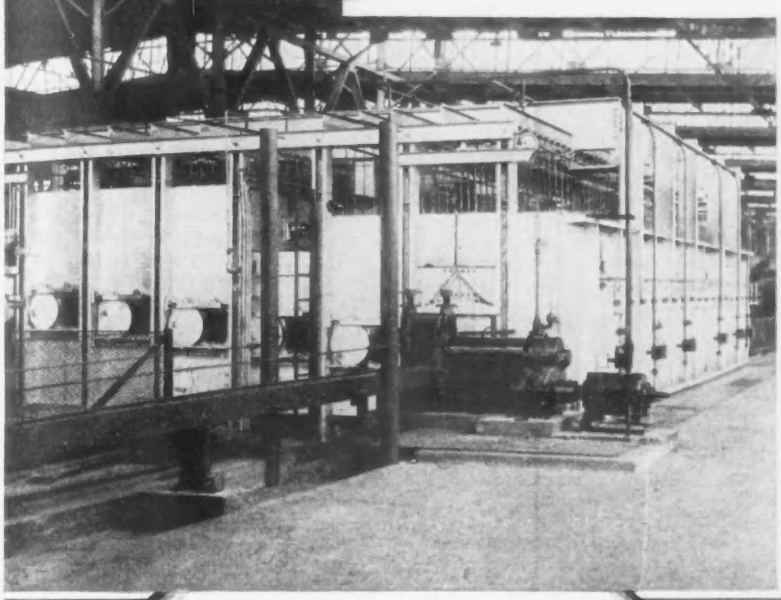
City Council, Shawnee, Okla., contemplates installation of electric-operated pumping machinery in connection with extensions and improvements in municipal waterworks. An election will be held Nov. 2 to approve bonds for $208,000 for project.

John A. Logan, Cushing, Okla., is at head of project to establish plant at Sapulpa, Okla., for manufacture of steel culverts. Company will be organized.

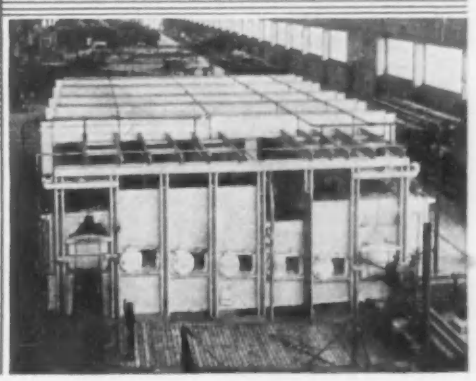
Union Pacific Railroad Co., Fifteenth Street, Omaha, Neb., plans extensions in coaling facilities at Marysville, Kan., including installation of automatic coal chutes, conveying and loading equipment, sand and water columns, etc., to cost over $100,000. G. J. Adamson, Omaha, is chief engineer.

State Board of Regents, Lincoln, Neb., will take bids for one-story shop, 65 x 100 ft., at State agricultural college at Curtis, Neb., to cost about $25,000 with equipment. Meginnis & Schaumberg, Federal Trust Building, Lincoln, are architects. L. F. Seaton is operating superintendent.

20 TONS OF FINISHED TUBES PER HOUR



TUBE normalization is an exacting heat treating operation. It demands accurate furnace atmospheric conditions and control—a furnace where time and heat cycles are regulated perfectly and exactly. Surface Combustion designed and built the continuous gas-fired tube normalizing furnace illustrated in this advertisement for a prominent Pennsylvania steel company. Results, after months of operation, have been beyond expectation. Tubes averaging 9⅝ in. diameter are normalized at the rate of 20 tons an hour. Surface Combustion has made revolutionary developments in tube normalizing furnace design . . . demonstrated by successful installations in many leading tube mills of the country.



This Surface Combustion tube normalizing furnace is fired with SC 2-stage high pressure burners . . . utilizing 1000 B.t.u. natural gas at 20 lbs. pressure.

OPERATED BY HENRY L. DOHERTY & COMPANY

Surface Combustion

SURFACE COMBUSTION CORPORATION
TOLEDO, OHIO.

SALES AND ENGINEERING SERVICE
IN PRINCIPAL CITIES

Sanitary Can Mfg. Co., Tulsa, Okla., recently organized by J. W. Hays, 1239 East Twenty-ninth Street, and associates, will operate plant for manufacture of tin cans and containers.

W. A. Curtis, street commissioner, Jefferson City, Mo., is considering erection of an equipment storage and distributing plant, with automobile service, repair and garage building for street and highway department. City Council has authorized project.

McDonald Machinery Co., 1531-33 North Broadway, St. Louis, is in market for a punch press, die-filling machine, tool grinder and other equipment.

City Council, Moberly, Mo., is considering erection of a municipal electric light and power plant.

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Indiana

FOLLOWING recent purchase of Yaxley Mfg. Co., 1528 West Adams Street, Chicago, manufacturer of radio parts and electrical equipment, by P. R. Mallory Co., 3029 East Washington Street, Indianapolis, manufacturer of electrical products, last-noted company is planning removal of acquired interest to Indianapolis where production will be concentrated and capacity increased. A subsidiary, under name of Yaxley Co., has been chartered in Indiana, with capital of $275,000 and 5000 shares of common stock, no par value. Philip R. Mallory is president.

Terre Haute Malleable & Mfg. Co., Terre Haute, is planning to rebuild part of plant, including south annealing shop, recently destroyed by fire, with loss about $40,000 including equipment.

Hardin Aircraft Corpn., Evansville, recently organized by R. E. Hardin, Evansville, and associates, plans operation of factory for production of aircraft and aircraft equipment. Walter Van Derbeken and L. C. Oliver, both of Evansville, are interested in new company.

McCray Refrigerator Corpn., Kendallville, manufacturer of refrigerators and refrigerator equipment, contemplates branch plant at Dallas, Tex., or vicinity, for which site will soon be selected. Initial plant will cost over $50,000. E. E. McCray is president.

Constructing Quartermaster, Quartermaster Depot, Jeffersonville, is asking bids until Nov. 3 for air corps hangar, with boiler house annex and facilities for service and repair work.

Kuhner Packing Co., Muncie, meat packer, has plans for a new two-story and basement plant, 75 x 130 ft., to cost about $70,000 with equipment.

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Gulf States

PLANS are under way by Belcher Oil Co., 1217 Biscayne Boulevard, Miami, Fla., for bulk oil storage and distributing plant at Port Everglades, Fla., to cost over $50,000 with equipment.

City Council, Cornelia, Ala., is considering installation of electric-operated pumping machinery and auxiliary equipment in connection with municipal water system, to cost about $75,000. Robert & Co., Bona Allen Building, Atlanta, Ga., are engineers.

D. P. Bates & Co., Hale Center, Tex., are planning erection of new flour mill, including screening, conveying and other equipment, to cost over $65,000 with machinery.

Board of Trustees, Agricultural and Mechanical College, College Station, Tex., has plans for new three-story petroleum engineering building, to cost about $200,000 with equipment. Board has also authorized plans for a three-story, factory type agricultural engineering building, to cost close to like sum. It is expected to ask bids on general contract in about 60 days. Prof. F. E. Giesecke, A. and M. College, is architect.

City Council, Starkville, Miss., is arranging a bond issue of $102,000, fund to be used for a municipal electric light and power plant.

City Council, Beaumont, Tex., has authorized a new municipal warehouse for cotton and other service, with installation of conveying and other handling equipment, to cost $100,000. Bonds in that amount have been approved.

Officials of Indian State Oil Co., Oklahoma City, Okla., John W. Sappington, president, are organizing Indian State Distributing Co. to handle output from new refinery of parent organization at Huntsville, Ala., where site was recently acquired. Plant will cost about $100,000 with equipment. New distributing company will operate in several counties in Alabama, and plans erection of bulk oil storage and distributing plants in different districts.

Clay County Board of Education, Ashland, Ala., has plans for a one-story vocational training school for colored students at Lineville, Ala. Architectural department, State Board of Education, Montgomery, is architect. E. W. Robertson is superintendent for board.

Texas Natural Gas Utilities, Ltd., Houston, Tex., is considering installation of natural gas distributing system at Port Lavaca, Tex.

American Eagle Aircraft Corpn., American Eagle Road, Kansas City, Mo., manufacturer of airplanes and parts, is considering establishment of new plant at Miami, Fla., including parts and assembling divisions. Company is contemplating removal of Kansas City works to that location.

Planters Gin & Milling Co., Greenville, Miss., is considering rebuilding part of cotton ginning plant recently destroyed by fire. Work will cost close to $60,000 with equipment.

West Texas Utilities Co., Abilene, Tex., is planning extensions and improvements in Panhandle district, including construction of transmission lines, distributing systems, power substations, etc., to cost close to $100,000.

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Pacific Coast

PLANS are under way by Upland Citrus Association, Upland, Cal., for new one-story ice and precooling plant, to cost $65,000 with machinery. W. W. Ashe, 1616 Fourth Avenue, Los Angeles, is architect.

Board of School Trustees, Sacramento, Cal., plans erection of a vocational training shop in connection with a new junior high school group. Bond issue of $1,146,000 has been authorized for institution.

United States Bureau of Public Roads, 461 Market Street, San Francisco, has plans for group of one-story mechanical buildings at Alameda, Cal., including machine shops, equipment storage and distributing buildings, administration building and other units, to cost about $500,000 with equipment. Bids will soon be asked.

Welbilt Body Co., Los Angeles, has been organized with capital of $75,000 to take over and expand company of same name, with automobile body manufacturing plant at 1400 East Adams Street. New company is headed by Victor A. and Otto P. Puff, and C. E. Memory.

Board of County Supervisors, Santa Ana, Cal., is planning installation of an elevated steel tank and tower with capacity of 100,000 gal., electric-operated pumping plant and other mechanical equipment in connection with water supply system for Orange County Water District No. 5, Westminster district.

City Council, Idaho Falls, Idaho, has plans for a municipal hydroelectric generating plant on Mesa River, to cost close to $2,000,000 with transmission system. C. R. Black is city engineer.

Neonachrom Tube Light, Inc., Seattle, care of Chambers & Masuda, Smith Tower Building, recently organized with capital of $25,000, plans operation of factory for manufacture of tube-lighting equipment and displays. Shirley T. Young and Earl Murray are heads.

United Collieries of Washington, Inc., Joseph Vance Building, Seattle, Herbert Tozier, president, is planning development of anthracite coal properties near Glacier, Wash., with installation of mining machinery, hoisting equipment, mine cars, bunkers, loading and other machinery, to cost close to $100,000.

Bureau of Yards and Docks, Navy Department, Washington, has awarded contract to Wallace Bridge & Structural Steel Co., Seattle, for hangar unit at new naval airplane station at Sunnyvale, Cal., 310 x 1125 ft., and 200 ft. high, at cost of $1,116,004. Other units will be erected later.

Duarte-Monrovia Citrus Association, Duarte, Cal., plans installation of conveying, loading and other equipment in new one-story and basement packing plant, 90 x 125 ft., to cost about $50,000 with machinery. A boiler plant will be built. Grant & Bruner, 607 Ferguson Building, Los Angeles, are architects and engineers.

City Steam Heating Co., Everett, Wash., is planning extensions and improvements in steam power stations and system, to cost about $35,000 with equipment.

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Foreign

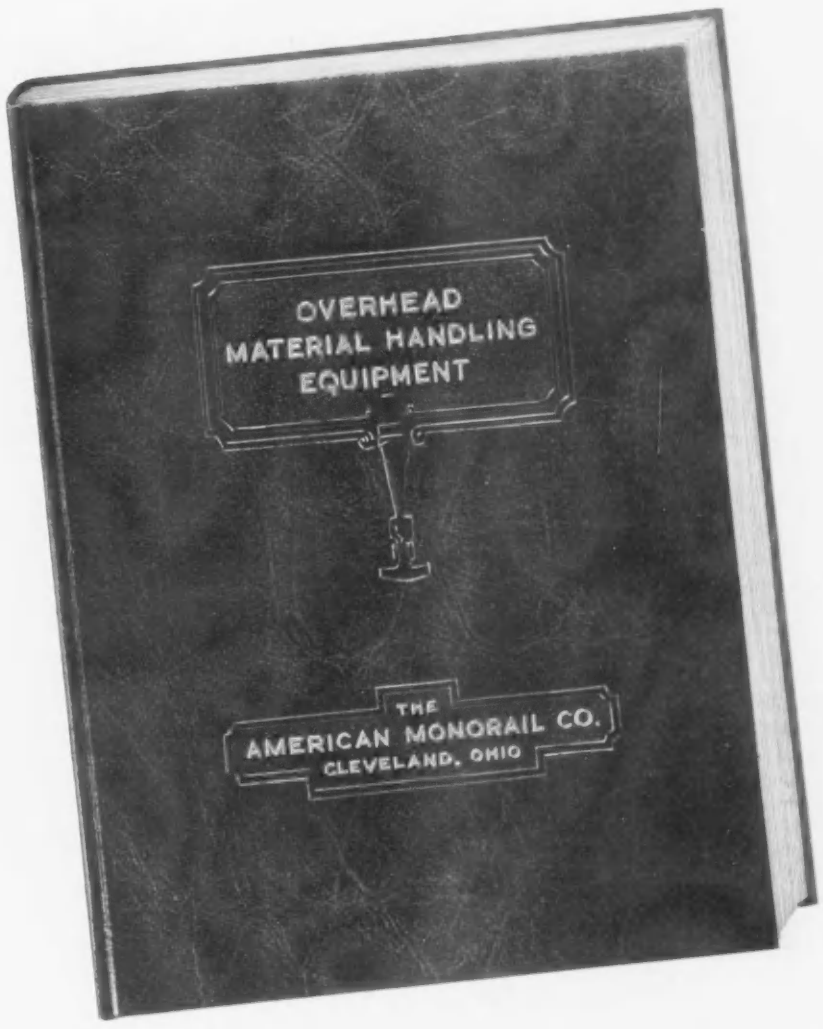
PLANS are being considered by Standard Oil Co. of California, Inc., 225 Bush Street, San Francisco, for development of oil properties near Tampico, Mexico, with installation of oil well machinery, storage and distributing facilities, pipe lines, etc., entire program to cost over $10,000,000.

General Manager, New Zealand Government Railways, Wellington, New Zealand, is asking bids until Feb. 29, 1932, for three automatic power substations and equipment.

Newcastle-on-Tyne Electricity Supply Co., Newcastle-on-Tyne, England, is planning power lines and distributing stations for electrification of entire North Yorkshire district, including more than 100 miles of transmission lines, to be installed under agreement with Central Electricity Board, London. Project will cost over $3,000,000.

General Manager, South African Rail-

AMERICAN MONORAIL



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▲▲ Business as Others See It

Digest of Current Financial and Economic Opinion ▲▲

DEFLATE railroad wage rates. That slogan is the aftermath of the Interstate Commerce Commission decision denying the railroads the 15 per cent freight rate increase sought. It comes from Alexander Hamilton Institute, from *Financial Chronicle*, from *Annalist*, from Central Republic Bank, Chicago (Charles G. Dawes's bank) and from other sources.

Some express the view that the demand for a freight increase was a mere forlorn hope, anyhow, and was intended as preliminary to demands for lower labor costs—the idea being that, as the one avenue to solvency was closed, the other was the only remaining recourse. From this standpoint, *Financial Chronicle* thinks that the decision "may prove a blessing in disguise." And Alexander Hamilton Institute says: "General business recovery and a consequent improvement in railroad traffic will be hampered until freight rates, by means of wage cuts, are brought down in line with commodity prices."

Motor truck speed in delivery is held, by the Chicago bank, the chief factor in its competition with the railroads. "The door-to-door delivery idea is an important factor, but a more important factor lies in the ability of a freight truck to pick up a load of merchandise and lay it down at its destination, possibly 200 miles away, on the day of shipment."

That commodity prices show signs of stabilizing seems to be a general opinion. This may not be true of individual commodities, but it seems to be so with most of the indexes. This view is expressed, guardedly, by Harvard Economic Society. Theodore H. Price, in *Commerce and Finance*, goes further, noting commodity markets "nearly all higher" and attributing this to a combination of cheap money, "finding its way into the markets, which must sooner or later go higher," and the fact that "many staple products are now to be had at less than the cost of production."

Comment regarding Mr. Hoover's plan of banking relief from "frozen credits" continues to come out. "Not much is expected from President Hoover's 'credit pool,' which is viewed as largely a salvage operation," says *Commerce and Finance*. Guaranty Trust Co. of New York, however, finds "the method chosen . . . particularly well adapted to the needs of the present situation." And the Chicago bank above quoted calls it "the outstanding event of the month in business and financial circles. . . . An important move in the right direction, there is grave danger of this plan being considered as a cure-all."

Business Is Found Better

Better sentiment is noted among business executives. Guaranty Trust Co. mentions this and says: "Present indications are that October business will show at least seasonal gains, putting an end to the long-sustained decline and making a real upward movement more possible." That bank cites the estimate that the fourth-quarter's freight shipments will be down only 7.6 per cent from last year as an indication of better times.

"Deflation and readjustment are nearing completion," says Union Trust Co., Cleveland, "and where these processes have been fully accomplished, activities already are beginning to quicken."

Annalist sees no early upturn, and suggests that the commodity price advances following announcement of the bank credit plan "may prove to be temporary." That paper reports "a strong feeling that in railroad transportation, as in every other part of private business, the only sound treatment for certain types of economic distress is to let economic laws take their natural course. . . . Railroads badly located, badly managed, with slight prospect of ever becoming prosperous" may not be worth preservation.

An unusual review of the wage-and-salary situation is made by Central Republic Bank, Chicago. "Salary reductions have been wholly out of proportion to wage reductions. The average of salaries during the expansion period, 1925-1929, remained low compared with the average of wages. Unskilled laborers enjoyed an income exceeding that of some workers in the professions, who had spent years of time and thousands of dollars in preparing themselves. . . .

"Even when proposed and contemplated wage reductions have been effected, the hand workers of America, skilled and unskilled, will still be occupying an enviable position when compared with either the head workers of America or the hand workers of any other country."

ways and Harbors, Johannesburg, South Africa, is asking bids until Nov. 16 for copper and steel plates for locomotive boilers.

Soviet Russian Government, Moscow, has approved plans for new hydroelectric generating plant on Volga River, near Samara, Russia. It will have capacity of 1,160,000 kw. and with transmission system will cost 1,200,000,000 rubles (about $600,000,000). Plant will constitute part of Great Volga power project, which will include four new hydroelectric generating plants on Volga River and three such units on Kama River. It is understood that Hugh L. Cooper & Co., 101 Park Avenue, New York, engineers, will supervise program. Amtorg Trading Corpn., 261 Fifth Avenue, New York, is official buying agency.

Minister of Public Works, Wellington, New Zealand, is asking bids until Dec. 15 for oil-immersed circuit breakers, 50,000-volt capacity.

Officials of Royal Dutch Shell Co., Amsterdam, Holland, and London, England, and Anglo-Persian Oil Co., London, operating with combined capitalizations of more than $500,000,000, are organizing joint subsidiary for distribution of oil, gasoline and kindred products in Great Britain and Ireland. New organization will establish bulk storage and distributing plants at different points, pipe lines, etc.

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New Trade Publications

Built-in Speed Reducers.—General Electric Co., Schenectady, N. Y. Insert sheet briefly describes built-in speed reducers, designed for use with G-E general-purpose induction motors, which consists of a straight-line, helical-gear reduction unit built into a standard motor.

Heat-Treating Furnaces.—Ryan, Scully & Co., Philadelphia. Bulletin 0-3A, describing and illustrating R-S oil-fired pot-type furnaces, using round or rectangular pots.

Motion Pictures.—General Electric Co., Schenectady, N. Y. Illustrated 32-page catalog lists various G-E motion-picture films, intended for disseminating information as to the electrical industry, its facilities and accomplishments and its relation to other industries. Illustrated lectures are described and listed also.

Welding Rods.—American Manganese Steel Co., Chicago Heights, Ill. New Amsco nickel-manganese steel welding rod is described in letter and memorandum of patent. The rod is used for repairing manganese-steel castings and reclaiming manganese-steel equipment such as dipper teeth, crusher mantles and jaws, railroad track members, etc.